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[1] For the detailed table of contents to this study see page 32.
[2] For the detailed table of contents to this study see page 55.

Synthetic Drugs and International Action

1 December 1949 marked the date of the coming into force of the Paris Protocol of 19 November 1948 bringing under international control drugs outside the scope of the Convention of 13 July 1931 for limiting the manufacture and regulating the distribution of narcotic drugs. It may be expected that the first application of this protocol will take place in the near future. In this connexion it might be interesting to analyse the juridical measures which led to its formulation.

The problem was as follows: certain synthetic drugs discovered after the conclusion of the 1931 Convention were or could be used for medical purposes in the place of other drugs which came within the scope of this Convention. These drugs were free from all international control. Although authoritative opinion in this field held that these drugs were addiction-forming, there was no international instrument by which they could be placed under the control established by the 1931 Convention. In other words, the manufacture of and trade in these synthetic drugs could neither be limited nor controlled in accordance with the provisions of the 1931 Convention: the measures provided by article 11 of this Convention, intended to bring new drugs within its scope, are limited to the phenanthrene alkaloids of opium and the ecgonine alkaloids of the coca leaf.

It should be observed, however, that synthetic drugs could have been placed under the national and international control provided by the Convention of 1925, in virtue of its article 10. This Convention, however, although its aim was to control the trade in those drugs to which it applies, does not directly control their manufacture, nor the trade in them. Moreover, the conclusions and recommendations on the harmful quality of a new drug formulated in virtue of this article 10 by the technical international bodies set up by the Convention bind merely those parties to the Convention who agree to these conclusions and recommendations.

Bearing in mind therefore the experience acquired in respect of the international control of new drugs in virtue of articles 10 and 11 of the 1925 and 1931 Conventions respectively, the Commission on Narcotic Drugs requested the Secretariat to examine the possibility of combining the advantages of the procedure provided by article 10 of the 1925 Convention (wider scope) with those of the procedure provided by article 11 of the Convention of 1931 (immediate effect and the obligatory character of the decisions taken by the international technical bodies).

The study of this problem led the Secretariat to conclude that, to overcome the existing difficulties in placing new addiction-forming drugs under international control, it would be necessary both to place them under the control established by the 1931 Convention and to take measures to render immediately obligatory, for the contracting parties, the decisions taken in respect of the harmful character of new drugs by the international technical bodies.

There were two possible ways of achieving this end: by amending the existing conventions, or by concluding a special international agreement.

Experience had shown that amending multilateral treaties having a large number of parties presented many difficulties and might give rise to juridical arguments. This was especially true when a convention, such as the 1925 Convention, contained no explicit provisions for its amendment. In addition to this general difficulty in amending the 1925 Convention, amending its article 10 would in no way have allowed new drugs to be placed under the control provided by the 1931 Convention. Indeed, all that could have been obtained by such a procedure was the possibility of placing the new drugs under the control provided by the 1925 Convention, which was, in the circumstances, quite insufficient.

Although article 33 of the 1931 Convention established a procedure for amending this Convention, an amendment to article 11 of this instrument would have met with the same general difficulties as an amendment to the 1925 Convention.

But a further, special difficulty also arose: the scope of the 1931 Convention is, as we said above, limited to the phenanthrene alkaloids of opium and the ecgonine alkaloids of the coca leaf as listed in its article 1, as well as to all products derived from these alkaloids

which may be added to this list in accordance with the procedure provided by article 11. Any amendment of article 11 intended to widen the scope of the Convention so as to include all new addiction-forming drugs, of whatever origin, would thus have an effect on article 1 as it was formulated in 1931. This effect might have repercussions on those other articles of the Convention which contain references to the term "drug" as defined in article 1.

Considering these difficulties, the Secretariat decided to recommend the conclusion of a separate international agreement based on the following conditions:

1. That the new agreement should be aimed at new addiction-forming drugs which did not come within the scope of the 1931 Convention;

2. That it should subject these drugs to the control set up by the 1931 Convention, that is, that it should limit and control the manufacture and trade in these drugs on the basis of the estimate system established by the 1931 Convention, including the application measures provided by article 14 of this Convention,

3. Finally, that it should contain provisions for the entry into force of the agreement which would be similar to those adopted for the 1931 Convention.

The studies and conclusions of the Secretariat were examined by the Commission on Narcotic Drugs at its second session. The Commission decided that amendments to the 1925 and 1931 Conventions would be insufficient for its purpose and expressed itself convinced that the conclusion of a new international instrument, which would systematically subject all addiction-forming drugs to the control provided by the 1931 Convention, was indispensable. The Commission accordingly recommended to the Economic and Social Council that the latter should request the Secretariat to prepare a draft protocol based on its studies and on the observations of the Commission on this subject.

Having noted the opinion expressed by the Commission on Narcotic Drugs, the Economic and Social Council, on 15 August 1947, adopted a resolution requesting the Secretary-General to prepare a draft protocol which would be communicated to the Governments concerned for their observations. It was also communicated to the World Health Organization to which the new protocol was to give important powers similar to those formerly given to the Health Committee of the League of Nations and to the *Office international d'Hygiène publique*.

The draft protocol was submitted to the States Members of the United Nations, as well as to the non-member States Parties to the international conventions on narcotic drugs, on 16 December 1947. The Governments of the latter States were thus enabled to participate in the drafting of the new instrument.

At its third session in May 1948, the Commission on Narcotic Drugs studied the draft prepared by the Secretary-General in the light of observations made by the Governments concerned and, after certain amendments, recommended its approval by the Council. In turn, the World Health Assembly approved the draft protocol at its session in July 1948. The Economic and Social Council was thus enabled, at its seventh session, to give its opinion on a text which had been carefully studied by the Secretariat, the Commission on Narcotic Drugs and the World Health Organization.

Having made several minor amendments to the text submitted, the Council adopted a resolution approving the draft protocol and recommending its adoption by the General Assembly. This resolution requested the Secretary General to communicate the draft to Governments in order to enable them once more to present observations. The resolution also proposed a series of measures to speed the General Assembly's adoption of the protocol and to hasten its signature by the plenipotentiaries designated by Governments. Thus the Council recommended that, taking into account any further observations submitted by Governments, the General Assembly should approve the protocol as early as possible in its third session, that it should set, as early as possible during this session, the date on which the Protocol would be open for signature, that it should invite all States to adhere to the protocol in the shortest possible time, that it should request States, as soon as possible, to take the necessary steps to extend the application of the protocol to their territories, and finally that it should see to it that the representatives of States Members of the United Nations to the third session of the General Assembly be provided with the credentials necessary to enable them to adhere to the protocol.

This meticulous technical and juridical preparation of the draft protocol was fully effective: on 30 September 1948, in a single meeting, the Third Committee of the General Assembly, which was meeting in Paris, after making some very slight drafting changes, approved, the draft protocol as it had been adopted by the Economic and Social Council. A few days later, on 8 October, the General Assembly, in turn, gave its approval to the Protocol and requested the Secretary-General to set the earliest possible date as that on which the Protocol would be open for the signature of States. On 19 November, at a ceremony held at the Palais de Chaillot, the governmental plenipotentiaries signed the new instrument destined to reinforce the international control of narcotic drugs.

In accordance with the provisions of chapter I of the Protocol every State Party to the Protocol is obligated to inform the Secretary-General of the United Nations of any drug used or capable of being used for medical or scientific purposes, and not coming within the scope

of the 1931 Convention, which that Party considers capable of abuse and of producing harmful effects. The Secretary-General is held immediately to communicate this opinion to the other States Parties to the Protocol as well as to the Commission on Narcotic Drugs and to the World Health Organization. The World Health Organization must then decide whether the drug in question is addiction-forming or capable of conversion into an addiction-forming product. The Secretary-General of the United Nations must be advised of the decision at once. He must then communicate this decision to all Member nations of the United Nations, to the non-member States Parties to the Protocol and to the Commission on Narcotic Drugs. Upon being informed of the decision of the World Health Organization, the States Parties to the Protocol must subject the drug to the appropriate control.

Chapter I of the Protocol also stipulates that, on receipt of the communication of the Secretary-General of the United Nations, the Commission on Narcotic Drugs may, pending notification of the conclusions of the World Health Organization, make the decision that appropriate measures should be provisionally applied to the drug with which the communication is concerned. Finally, chapter I stipulates that the conclusions and decisions reached either by the World Health Organization or, provisionally, by the Commission on Narcotic Drugs may be altered in the light of experience.

It should be emphasized that there are two important innovations in the international control of narcotic drugs resulting from these provisions. In the first place, while the 1912 and 1925 Conventions define the drugs falling under their scope by their chemical formulae, and the 1931 Convention, adopting the same system, in addition placed under control drugs derived from certain raw materials, the Paris Protocol applies to all drugs capable of producing a specific effect, namely, drugs "liable to the same kind of abuse and productive of the same kind of harmful effects as the drugs specified in article 1, paragraph 2, of the said [1931] Convention". Accordingly, it makes possible the placing under international control of not only new synthetic drugs, of which several have already been found particularly dangerous, but also any addiction-forming drug, whether already discovered or to be discovered in the future. In the second place, article 2 of the Protocol allows the Commission on Narcotic Drugs to take interim measures provisionally to place under control, pending the receipt of the conclusions of the World Health Organization, a drug considered by a State Party to the Protocol as liable to produce addiction or as capable of being transformed into such a drug.

The general provisions contained in chapter II of the Protocol are intended—and this intention has already been realized to a considerable extent—to ensure that the Protocol should enter into force quickly and that its application should be as wide as possible. Article 5 reproduces a formula first used in an international agreement concluded under the auspices of the United Nations in the case of the World Health Organization, and reproduced immediately thereafter in the Protocol of 11 December 1946 concerning the transfer to the United Nations of the functions and powers previously exercised by the League of Nations in the field of the international control of narcotic drugs. According to this formula, States whose constitution authorizes it, and who are willing to do so, are allowed to adhere to the Protocol merely by signing it. For other States this formula provides for a procedure of subjecting the signature to a future acceptance or to the deposition of an acceptance equivalent to an adherence in the usual relevant meaning of the term in international law.

The provisions of article 6 were rapidly fulfilled. They were intended on the one hand to ensure universal application of the new instrument, and on the other to guarantee that this instrument should enter into force only under certain conditions concerning the number of States participating in it. The first aim was to be achieved by interplay with the corresponding provisions of the 1931 Convention. As for the second, the entry into force of the Protocol was made subject to the actual participation of at least twenty-five States, of which a minimum of five were to be among the eleven "most interested" States named in the article itself. Finally, the provisions of article 8 were concerned with territories represented, with regard to their foreign relations, by States Parties to the Convention. These provisions had, at the time when the Protocol was being examined, given rise to prolongued discussions. They did not, however, give rise to any particular difficulties at this last stage, the States concerned having bound themselves to apply the Protocol to these territories either at the time when they signed it, or in the future.

* * *

The Paris Protocol came into force. A further step was made in the international control of narcotic drugs. It is now up to Governments to bring this work to completion. It was with this in mind that, on the occasion of the ceremony of signing the Protocol, Mr. Henri Laugier, Assistant Secretary-General in charge of the Department of Social Affairs, anticipating the successful passing of the initial stages, expressed as follows the hope of its positive realization in the near future: "Today marks the end of the first phase of the effort by the United Nations, working as an organization, to bring synthetic drugs under international control. The next step must lie with individual Governments and it is now for them so to act that the Protocol may come

into force at the earliest possible date. But in addition to this, one final but vitally important factor remains: it is that the successful control of illicit traffic in narcotic drugs is above all else dependent upon international co-operation. This fact was emphasized by every representative who took part in the debate in the General Assembly, where it was stated again and again that the provisions of the Protocol must be universally applied if the dangers from these drugs to which I have already referred are to be averted. I therefore trust that all States will scrupulously apply the provisions of the Protocol at all times, in the spirit as well as the letter of the General Assembly's resolution of 8 October."

STATES PARTIES TO THE PARIS PROTOCOL

as at 10 February 1950

State	*Date of becoming party*
Afghanistan	19 November 1948
Australia	19 November 1948
Byelorussian Soviet Socialist Republic	19 November 1948
Canada	19 November 1948
China	19 November 1948
Lebanon	19 November 1948
Mexico	19 November 1948
Monaco	19 November 1948
New Zealand	19 November 1948
Saudi Arabia	19 November 1948
Union of Soviet Socialist Republics	19 November 1948
United Kingdom of Great Britain and Northern Ireland	19 November 1948
Union of South Africa	8 December 1948
France	11 January 1949
Ceylon	17 January 1949
Poland	26 January 1949
Sweden	3 March 1949
Italy	14 March 1949
Ethiopia	5 May 1949
Norway	24 May 1949
Yugoslavia	10 June 1949
Albania	25 July 1949
Egypt	16 September 1949
Denmark	19 October 1949
Finland	31 October 1949
Yemen	12 December 1949
Czechoslovakia	17 January 1950

Signing the Paris Protocol

EXTRACTS OF SPEECHES MADE AT THE GENERAL ASSEMBLY AT THE TIME OF THE DISCUSSION OF THE 1948 PROTOCOL

The Protocol placing under international control certain drugs not covered by the Limitation Convention is now in force. The *Bulletin on Narcotics* presents extracts of some of the speeches made at the time of its adoption at the third session of the General Assembly of the United Nations.

Mr. RAU (India):[1] ". . . It is easy to imagine what would happen if the Committees in the adjoining room were to adopt unanimously, after a single day's discussion, a convention for the control of atomic energy. Yet is there such a great difference between the two problems? Both are the result of progress in scientific research, a progress which might be put to either good or bad uses. The destruction which the atomic bomb could wreak, though more limited, is more spectacular, whereas synthetic drugs do their work more insidiously, more continuously and on a larger scale. They destroy the mind before they destroy the body. . ."

Mr. EMILE ST. LOT (Haiti) (rapporteur, Third Committee):[2] "In submitting the Report on the draft protocol placing under international control certain drugs not included in the Convention of 13 July 1931, I think it is my duty as Rapporteur to draw the attention of the General Assembly to the fact that the Third Committee took the decision unanimously with regard to the protocol and with regard to the resolutions now submitted to the Assembly. This unanimity was shown during the discussion on the two conditions which the Committee deemed essential for the success of our efforts, in order to forestall and master a danger which becomes more and more threatening, a danger of the appearance of synthetic new drugs which do not fall under the application of the existing treaties and which, if abused, are liable to engender and to spread drug addiction all over the world.

"The first of the conditions I have mentioned is the proposal of universality of the application of the Protocol. Experience painfully acquired by the Governments of the world during long decades of difficult struggle against drug addiction and illicit traffic of drugs has proved that isolated efforts by Governments were not able to put an end to the evil. The most perfect legislation applied by the best organized administrators and by the best intentioned administrators who had all the means necessary to enforce it still were insufficient and very powerless before this insidious evil, as long as the Govert.ments led the struggle single-handed.

"This is one of the essential reasons why The Hague Conference of 1912, and still more clearly, the Geneva Conferences of 1925 and 1931 set forth principles of coordination on an international level, at the level of the efforts of Governments and of the universal application of treaties concluded by these Conferences.

"In fact, it suffices that there should be a single territory in the world where the control over the manufacturing and distribution of drugs is not exercised with all vigilance, it suffices that there should be a single territory where the struggle against drug addiction and illicit traffic is not coordinated under the supervision of international control organs for this territory to become a focus of clandestine fabrication and illicit traffic from which drugs spread out and flood the world.

"These are the imperative reasons taken into account by the Third Committee in drafting and approving unanimously these passages which are submitted to the General Assembly for approval."

[1] Document A/C.3/SR.88, 2 October 1948, summary record of the 88th meeting.

[2] Document A/PV.149, 8 October, 1948, verbatim record of the 149th meeting.

Mr. P. C. CHANG (China):[3] "The Protocol before the General Assembly is a turning point in the campaign against the ever present danger of the abuse of narcotic drugs and of drug addiction.

"Science, more particularly modern pharmacology and chemistry, progressing rapidly in the field of synthetic drugs, has put at the disposal of medical therapy new analgesic substances capable of alleviating pain and suffering. Experts assure us that these substances should prove increasingly useful in the treatment of the sick and ailing, but at the same time we are warned that they are liable to cause drug addiction and if abused destroy the body and mind of men. These new synthetic drugs do not differ from the old and known ones like morphine, for instance. However, they differ from them in one very important respect; they do not fall under the existing international conventions on narcotics and thus completely escape international control. Thus, unwittingly, science has opened a dangerous loophole in the national and international system of control, a system of social defence built up patiently and with great effort in the last three decades by the concerted action of some seventy governments. It is generally known that this system, and the international administration created under the 1925 and 1931 Conventions, have functioned with a remarkable measure of success. There can be no doubt that the efficient operation of the international control machinery has resulted in an effective limitation of the manufacture of drugs to medical needs and in arresting the spread of drug addiction which, after the first World War, assumed in many countries the proportions of an epidemic. This system of international control and social defence is now in jeopardy and may crumble quickly if the new synthetic drugs are not brought speedily under control. The protocol before the Assembly aims at extending the existing system of control to these new drugs.

"The Chinese people know from a long and bitter experience how real and devastating narcotic substances can be. . ."

Mrs. ROOSEVELT (United States of America):[4] "It is not always possible in international affairs, or even in local affairs, to reach unanimity when we need it, or universality when we must have it, or to demand speed and get it. But here is a situation apparently where we have all three. With this in mind, as we consider the proposed protocol and resolution for the control of new types of synthetic drugs, the United States delegation wishes to pay tribute to the remarkable work done by the Secretariat of the United Nations in developing and

[3] Document A/PV.150, 8 October 1948, verbatim record of the 150th meeting.
[4] *Ibid.*

Mrs. Vijaya Lakshmi Pandit of India signs the Protocol on behalf of her Government

His Excellency Ambassador Bogomolov of the USSR signs the Protocol on behalf of his Government

Mr. Willard L. Thorp signs the Protocol for the United States of America

protecting these modern instruments of control in conjunction with the Commission on Narcotic Drugs, the Economic and Social Council and the Third Committee of the General Assembly.

"It is particularly gratifying that these documents are apparently acceptable to all of us, for without universal acceptance of the protocol there would be gaps in the network of narcotics control over the new synthetic drugs, drugs which are as dangerous as they are easy to produce and their manufacture cannot be regulated through existing agreements. Without unanimity in purpose and method we could not be assured that the necessary regulations would be firmly and efficiently applied.

"When the final vote of those in favour took place in the Third Committee, every representative around the table raised his hand. I hope that will happen here too in this plenary session of the General Assembly. Like other scientific discoveries of our age, these new drugs have come upon us suddenly with their power for good or evil. Speed has been necessary to meet this threat and continues to be necessary as we adopt and apply the measures of control.

"With skill and with concern for the views of various nations, the protocol and resolution have been prepared so that we may approve them without hesitation and with real enthusiasm. These measures are designed to supplement and, in effect, modernize the existing conventions of 1925 and 1931, and they will draw upon the resources of the United Nations Secretariat, the Commission on Narcotic Drugs, and the World Health Organization in such a way as to weave stronger the fabric of international co-operation. This latter achievement, of course, has not been won without effort.

"I am told that narcotics control has a history of over a hundred years, and the notable work of the League of Nations in this field was only the most extensive and recent foundation for the excellent system now operated by the United Nations. Even in the Third Committee our unanimous decision was not reached without difficulty and mutual adjustment of divergent views. . ."

Mr. MALIK (Lebanon):[5] ". . . I should like to draw the attention of the General Assembly to the fact that both the Economic and Social Council and the Third Committee were greatly impressed by the urgency of the matter before the General Assembly and by the necessity of rapidly taking adequate measures to bring under international control synthetic drugs which are liable to create drug addiction.

"I should add that anyone who attended the meetings of the Committee on Narcotic Drugs or studied the record would be equally impressed by the sense of great urgency which animated the deliberations of that Committee on the protocol which is now before the General Assembly.

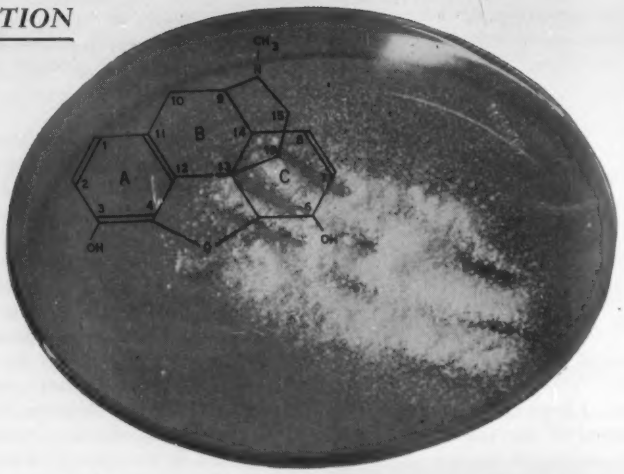
"In modern times legislative processes, even if they are not impeded by political considerations, are slower than scientific discoveries, and legislators—above all international legislators—need sometimes considerable time to regulate by law conditions changed by the progress of science. The protocol before the General Assembly was drawn up in record time. In August last year on the proposal of the Committee on Narcotic Drugs the Economic and Social Council requested the Secretary-General to draft the protocol and to circulate it to Governments for their comments. In May this year the Committee on Narcotic Drugs and in August the Economic and Social Council approved the draft amended in the light of observations by Governments; and now, in less than 14 months since this question was first taken up by the United Nations, the General Assembly is called upon to approve the protocol and the Secretary-General invited to fix the earliest date possible for its signature during the present session of the General Assembly. This is certainly a very satisfactory result, and which let us say it would be impossible to achieve without or outside the United Nations.

"Let us imagine, indeed, that the matter had to be handled through the ordinary diplomatic channels, and international conferences had to be called, especially to conclude a protocol of this kind. We know from experience that many years are needed to obtain a result for which the United Nations required less than fourteen months. I may be permitted to bring out another point which deserves particular attention. . ."

Mr. PAVLOV (Union of Soviet Socialist Republics):[6] "The USSR delegation agrees with the text of the protocol under discussion, as it is now drafted, but it does object to article 8 of the protocol, because article 8 does not cover the lack of control and the utilization of control in such countries where the illegitimate use of narcotics is most widespread.

In view of what I have just said, article 8 of the protocol does not appear acceptable to the USSR delegation. That article, in the present draft, provides that any State which becomes a signatory to the protocol now, or any time after it has become a signatory thereto, may or may not extend the protocol to all or some of the territories for which it is responsible. That means that the question as to whether the protocol will or will not be extended to such territories is left entirely to the metropolitan Powers . . ."

[5] *Ibid.*
[6] Document A/PV.150, 8 October 1948, verbatim record of the 150th meeting.



The Structure of MORPHINE

By Paul B. Weill, Ph. D.

HISTORY

The knowledge of practices and remedies for conquering pain dates back to the earliest times. Although Babylon, Egypt and mythological Greece have left only rare and scanty evidence of their knowledge, Greece and Rome, on the other hand, have left us numerous detailed documents concerning analgesic preparations of acknowledged efficacy in those days.

These preparations, obtained mostly from plants, the most important of which were mandrake, henbane, the poppy and certain varieties of hemp, were completely described by Galen and Dioscorides, among others.

From the point of view of analgesic properties the opium poppy is certainly the plant with the widest and most justified reputation. Opium and its preparations, the knowledge of which was handed down through the Middle Ages by Arab medicine, have always been recognized as sovereign remedies against pain. Opium, as we know, is the dried juice obtained by making incisions in the green capsules of the opium poppy *(Papaver somniferum)*, utilized varieties of which grow in the Balkans, Asia Minor, Persia, India, China, etc.

This raw product was used in medicine for centuries, in the form of tinctures, elixirs, compound powders, all of these being empiric forms whose activity differed according to their origin and concerning which neither the complex nature nor the fact that only one of the constituents was actually responsible for the activity was realized.

At the beginning of the nineteenth century, Sertürner[1] in Germany, Derosne[2] and Séguin in France thought out and accomplished the isolation of the active constituent of opium. This early work passed unnoticed and it was only the second publication of Sertürner, in 1817, in which for the first time this active principle was called "morphine", that aroused attention and gave rise to a large number of works.

This discovery was of considerable importance, because on the one hand it demonstrated the possibility of attributing to a clearly defined chemical product the activity of a complex drug and, on the other hand, a basic product had for the first time been isolated from a natural substance. The name "alkaloid" ("resembling an alkali") was adopted for this whole group of basic substances, large numbers of which were subsequently discovered.

In 1803, Derosne[1] had described as "salt of opium" a precipitate obtained by the action of potassium carbonate on an aqueous extract of opium; he had clearly observed its solubility in an acid medium and its precipitation by bases; but he had not emphasized either the novelty of the substance or its characteristics. This "salt of opium", according to Sertürner, was acid meconate of morphine or, according to Pelletier, narcotine, an alkaloid which was later isolated from opium but does not possess any narcotic activity, in spite of its name.

Another landmark was Séguin's communication to the *Académie des Sciences,* in 1804, announcing the isolation and characterization of morphine. As this work was not published until 1814, the discovery of the first of the alkaloids, morphine, is generally attributed to Sertürner.

Research, at first analytical, devoted itself to isolating the various constituents of opium, and establishing their formulae and constitution. This stage is not at an end, for the very structure of morphine still remains a matter of controversy. Assisted by the early progress made in the analytical field and by the tremendous impulse afforded by organic chemistry, synthetic work soon began. It was first directed towards the preparation of derivatives of the natural alkaloids of opium and later, indeed only recently, towards research into purely synthetic substances related to morphine by their analgesic properties and by a more or less remote similarity of composition.

All this work could neither have developed nor come to anything without the vigorous and fruitful efforts of pharmacologists and doctors. Important as it is, however, this dual pharmacological and clinical aspect of the question of morphine analgesics will here only be touched upon in passing, and solely in so far as it may help to clarify the question. The subject of the present article will be restricted to the chemistry of morphine, its derivatives and the synthetic analgesics.

THE CHEMISTRY OF MORPHINE[4]

Whatever their origin, the various types of opium seem to contain the same alkaloids, the only difference being in the proportions. Over twenty alkaloids have been isolated. Besides morphine they include some of its nearest related substances, such as codeine, thebaine, neopine; and others mainly belonging to a different chemical series, of which papavarine is the chief.

Only the first group of alkaloids chemically related to morphine will be considered here, since morphine cannot be studied without reference to the related alkaloids.

Before giving an account of the observations which have enabled us to build up our present knowledge of morphine, it seems necessary, for the sake of clarity, to start by giving the generally accepted formulae for the most important alkaloids in its group, which we shall have occasion to mention in the course of this article.

Of the six alkaloids represented below, only morphine and codeine are used in medicine. Neopine[5] is found in only very small proportions in opium. Oripavine[6] is present with its methyl ether, thebaine, in an Asiatic poppy, the *Papaver orientale;* its chemical composition was elucidated only in 1948. Thebaine, the most toxic of the opium alkaloids, is used as raw material for the preparation of derivatives such as eucodal and metopon. Although not found in opium, sinomenine is included here on account of its close chemical relationship to codeine. It was the subject of thorough research by Japanese writers, who described it as the optical antipode of a codeine derivative.

I. Known characteristics

The observations or studies which brought to light the functional and structural characteristics on which the developed formulae of morphine and the related alkaloids are based are recalled below:

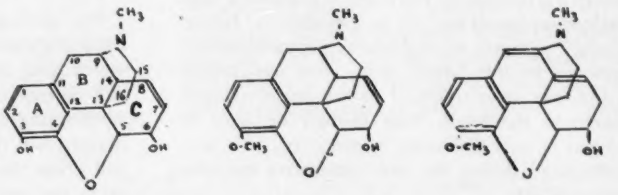
1. *Elementary composition of the three main morphine alkaloids*

   Morphine: $C_{17}H_{19}O_3N$; codeine: $C_{18}H_{21}O_3N$; thebaine: $C_{19}H_{21}O_3N$

2. *Presence in morphine of three oxygen atoms, one of which belongs to a phenolic hydroxyl* (solubility in bases from which carbon dioxide re-precipitates it; change of morphine (phenolic) into codeine, or methylmorphine, by methylation; *the second, to a secondary alcohol group* (absence of the phenolic character of codeine; esterification; oxidation into a ketone, codeinone VII); *and the third, chemically inert, to an epoxydic cycle* (this point will be developed later).

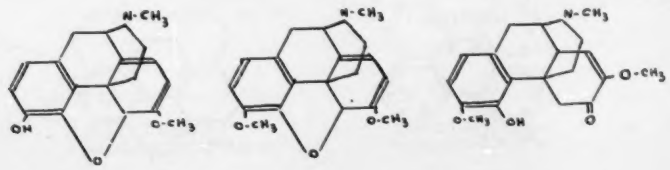
Left to right:

MORPHINE
CODEINE
NEOPINE



Left to right:

ORIPAVINE
THEBAINE
SINOMENINE



3. *Functional relations between morphine, codeine and thebaine*

As we have seen, codeine is none other than methylmorphine. Codeine itself is oxidized into codeinone, and the methyl ether of the enol form of this is the same as thebaine.

The latter alkaloid contains two methoxyl groups, as Zeisel's reaction shows, and two ethylenic bonds. The existence of these bonds was not easy to demonstrate: the catalytic hydrogenation of thebaine produces a complex mixture,[7] the main constituents of which are dihydrothebaine VIII, and a ketonic base, dihydrothebaine IX. It was not until 1927 that a compound identified as the dimethyl ether of morphine was finally isolated from the mixture of the products of hydrogenation.[8] To conclude this enumeration of the most striking chemical interrelations between morphine, codeine and thebaine, it should be recalled that, as Knorr demonstrated in 1909,[9] acids transform thebaine into codeinone VII.

Hence, after the demonstration of these close relationships between the three main morphine alkaloids, it was justifiable to apply to them as a whole the particular conclusions drawn from the structural study of one of them, a point which was very useful in elucidating their formulae.

4. *Presence of a double ethylenic bond in morphine and codeine*

This is easily demonstrated by hydrogenation of these alkaloids into their respective dihydro derivatives.[10]

5. *Presence of a methylated tertiary-amine nitrogen atom*

The basic properties of the morphine alkaloids are attributable to an amine function. In codeine, for instance, this is capable of fixing a single molecule of methyl iodide. The action of boiling potassium on this quaternary base produces a new tertiary base $C_{19}H_{25}O_3N$ or methylmorphimethine. Repeating the same process (exhaustive methylation or Hofmann degradation) with the methylmorphimethine, it is possible to isolate, among other products of degradation, trimethylamine. The presence of this amine shows that one methyl group, and one only, is linked to the amine nitrogen of codeine: in the result, three methyls are fixed to the nitrogen in trimethylamine, whereas only two have been introduced during the two consecutive methylations effected.

6. *The nitrogen atom of the morphine alkaloids forms part of a heterocycle*

The degradation of codeine iodomethylate, described in paragraph 5, which is done without loss of nitrogen to form methylmorphimethine, already provides irrefutable proof of this. The study of the action of acetic anhydride on methylmorphimethine completes the demonstration, as the nitrogen atom is then detached in the form of dimethylethanolamine $HO\text{-}CH_2\text{-}CH_2\text{-}N(CH_3)_2$.

As it has been shown that the molecule really separated was vinyldimethylamine, the nitrogen chain cannot be linked to the rest of the codeine molecule by oxygen (as this comes from the addition of water to vinylamine) but must be linked by the terminal carbon in its ethyl chain.[11]

7. *Presence of a partially hydrogenated phenanthrene nucleus*

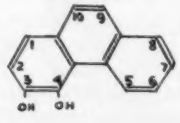
The distillation of morphine on zinc powder had long indicated the presence of the phenanthrene nucleus[12] in the morphine molecule; but this too brutal reaction failed to show up the special characteristics of this phenanthrene. Phenanthrene oxygenated compounds[13] later identfiied by synthesis were obtained either by alcoholysis or acidolysis of morphine alkaloids, or by the Hofmann degradation of thebaine, methylmorphimethine or its derivatives, fixing the positions of the substituents in the morphine. Lastly, it should be noted that a partial saturation of the phenanthrene nucleus is necessitated by the hydrogen content of the morphine.

8. *Positions 3 and 6 of the hydroxylic oxygen atoms and 4,5 of the epoxydic oxygen atom*

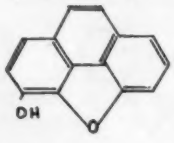
The action of acetic anhydride on the iodo-methylates of morphine or codeine, or directly on methylmorphimethine, gives either morphol I[13] and morphenol II,[14] or their methylated derivatives, and thus makes it possible to fix the phenol group—free in the case of morphine and methylated in the case of codeine—in position 3.

The alcoholic hydroxyl is eliminated in the course of these degradations but survives in the case of thebaine, which gives thebaol III.[15] The fact that both thebaine and codeine can be transformed into the same ketone justifies the application to codeine of the conclusions drawn from the study of the degradation of thebaine, and hence the fixing of the alcoholic hydroxyls of codeine and morphine in position 6.

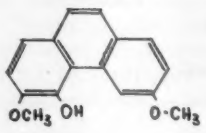
MORPHOL I



MORPHENOL II



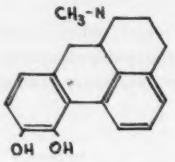
THEBAOL III



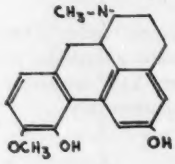
Moreover, since the action of acetic anhydride on codeinone makes it possible to isolate 3-methoxy-4:6 dihydroxyphenanthrene,[16] the respective positions of the phenol group and of the alcoholic hydroxyl must clearly be 3 and 6. The constitution of these phenanthrene derivatives (morphol,[17] morphenol, thebaol,[18] etc.) was explained by Pschorr, who pioneered in the field of phenanthrene synthesis and succeeded in synthesizing the substitute phenanthrenes which have made it possible to identify by direct comparison most of the products of degradation of the morphine alkaloids.

The acid dehydration of morphine and thebaine into apomorphine IV and morphothebaine V respectively fully confirms these results. Späth and Hromatka succeeded in synthesizing racemic apomorphine,[19] the benzoylated derivative of which is identical with the product of the benzoylation of levorotatory apomorphine.

APOMORPHINE IV



MORPHOTHEBAINE V



9. *Positions 7:8 of the double bond of morphine and codeine, position 6:7 and 8:14 of the two double bonds of thebaine*

(*a*) *Morphine and codeine*

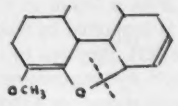
The action of chlorinating agents, such as PCl_3, PCl_5, or $SOCl_2$, on codeine gives α-chlorocodide, which may be transformed into β-chlorocodide or can be made by hydrolysis to yield a mixture of three codeine isomers. One of these isomers, isocodeine, is the result of a Walden inversion at C-6, as shown by its oxidation into codeinone VII and by the degradation of the latter into 3,4,6-trimethoxy-phenanthrene. The other two isomers, allo-codeine and allo-pseudocodeine, both oxidize into pseudocodeinone, the subsequent degradation of which gives 3,4,8-trimethoxy-phenanthrene VI.[20]

Hence it may be concluded that the four isomers form two pairs of stereo-isomers,—codeine and isocodeine, allo-codeine and allo-pseudocodeine—since neither of the pairs, on oxidation, gives more than one ketone, which is the same in each case.

The theory that the two pairs are linked by isomery goes back no further than 1923, when Gulland and Robinson,[21] and Wieland, independently advanced the hypothesis that an allyl migration took place, causing the alcoholic hydroxyl to move from C-6 to C-8, while the double bond shifted simultaneously from 7:8 to 6:7.

This migration falls into a well-known pattern—the same pattern as is used, in particular, to explain the geranoil-linalool isomery.

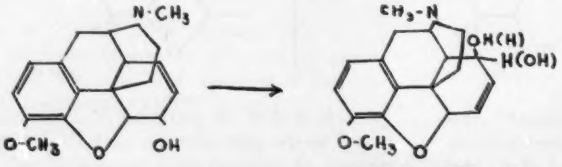
Still further confirmation is provided by the formation of phenol derivatives in the catalytic hydrogenation by hydrogenolysis of the allyl system of allo-codeinone and allo-pseudocodeinone, and the positions of the ethylenic bonds of morphine and codeine must therefore be fixed at 7:8.[22]



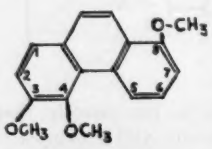
(*b*) *Thebaine*

The formula for thebaine shows that it contains one double bond more than codeine. One of these double bonds is situated at 6:7, since the formation of dihydrothebainone IX,[7] referred to in paragraph 3 above, is undoubtedly a case of hydrogenolysis similar to the cases we have just mentioned. Moreover, the acid hydrolysis of thebaine and dihydrothebaine,[7] which give codeinone and dihydrocodeinone respectively—a normal reaction of enolic ethers—makes the existence of an enol extremely likely.

The conjugation of the second ethlyenic double bond of thebaine with the first has been proved by, *inter alia*, the recent research of Sandermann and Schöpf[23] (1938), who showed that thebaine lends itself to the Diels-Alder condensations with maleic anhydride and quinones. The addition of maleic anhydride, for example, gives a compound XI of which the methoxy group no longer reacts to acids.

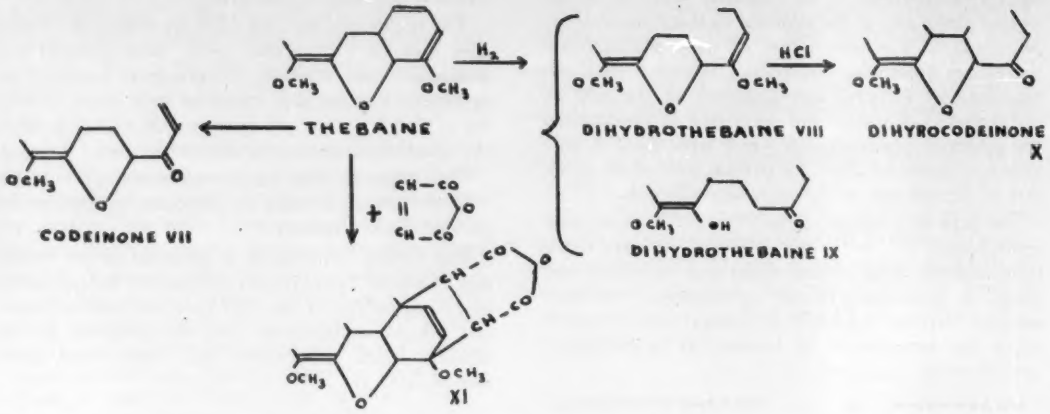


ALLO-CODEINE
ALLO-PSEUDOCODEINE



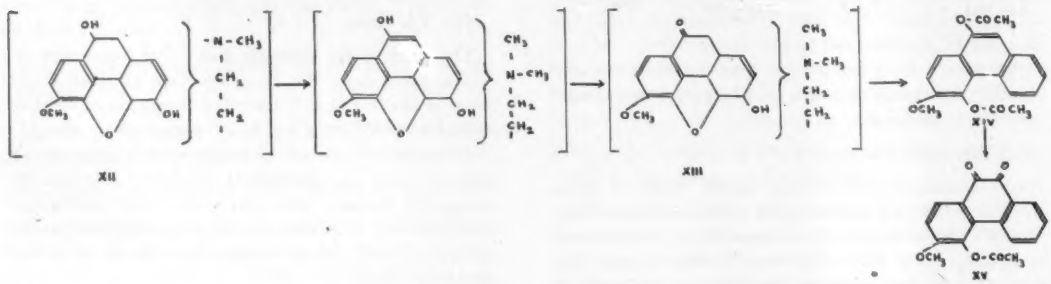
3,4,8-TRIMETHOXY-PHENANTHRENE VI

The following formulae illustrate these thebaine reactions:

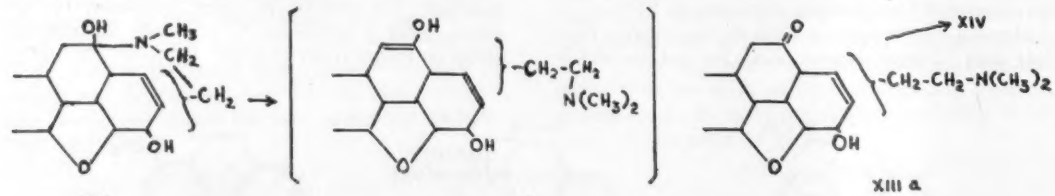


10. *The nitrogen atom is linked to C-9*

This deduction is supported by Knorr's work (1906) on hydroxycodeine XII. Prepared by the controlled oxidation of codeine,[24] hydroxycodeine results from the attachment of one hydroxyl to C-10, since exhaustive methylation[25] gives a ketone XIII which, when treated with acetic anhydride, yields a methoxy-diacetoxyphenanthrene XIV oxidizable into methoxyacetoxy-phenanthrenequinone XV.



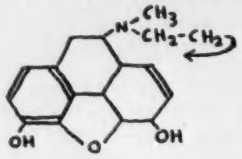
The loss of one of the acetoxy groups in the process of oxidation can be explained only if the alcoholic hydroxyl of the hydroxycodeine was located at 9 or 10. Since, moreover, compound XIII is ketonic, the hydroxyl must necessarily be attached to the same carbon atom as the nitrogen, or to an adjacent carbon atom. Knorr adopted the former hypothesis and explained the series of reactions in the following way:



Although it has recently been established[26] that Knorr's formula XVI is unlikely to be correct with regard to the position of the extra hydroxyl of the hydroxycodeinone, his remaining deductions still hold good. It is clear, in particular, that the nitrogen is attached to the phenanthrene nucleus at C-9, while the position of hydroxyl must be at 10. An inversion of these positions is just possible, with the nitrogen at 10

and the hydroxyl at 9, but it would then be difficult to understand why codeine should oxidize into hydroxycodeine.

On the basis of the general conclusions to be drawn from the whole of the foregoing discussion, the formula for morphine may be represented as follows:



XVII

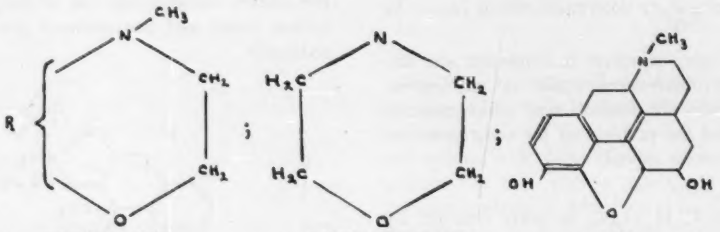
11. *Nature of the nitrogen nucleus*

Some of the degradation reactions referred to above separate the nitrogen of the alkaloid from the phenanthrene nucleus in the form of dimethylethanolamine.[27] As iodomethylation preceded degradation proper, it must be concluded that the $-N(CH_3)-CH_2-CH_2$ chain was originally linked to the phenanthrene nucleus.

At first it was claimed[28] that this chain belonged to an oxazine XVIII, "morpholine", whence the name "morpholine"[29] for the nucleus XIX from which the morphine seemed to be derived. It was later recognized that the oxygen of ethanolamine in reality formed no part of the original molecule and was the result of a secondary hydration of a vinylamine.

In 1902,[30] after explaining the structure of morphenol II, Pschorr proposed formula XX, which related morphine to apomorphine IV.

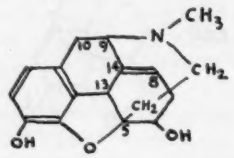
This formula in turn had to be abandoned as the result of the work on pseudocodeine (see 9(*a*)), the alcoholic hydroxyl of which is in position 8—a position which would not be free if the heterocyclic nitrogen chain were attached to it.



OXAZINE XVIII ; MORPHOLINE XIX ; XX

The only remaining possibilities were that the nitrogen chain $CH_2-CH_2-N(CH_3)$ was attached at position 5, 7, 13 or 14.

Formula XXI, which was proposed by Knorr and Hörlein in 1907,[31] was accepted in principle for almost twenty years, discussion being confined to the existence or the position of the double bond.



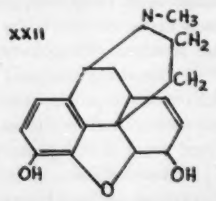
XXI

Attachment at 7 could not be defended after it was proved that dihydrocodeinone X, prepared by reduction of codeinone VII or by acid treatment of dihydrothebaine VIII, possessed a $CO-CH_2$ group.

Nor can position 14 be accepted since, if it were, there would be no place for the conjugated double bonds of thebaine.

The structure formulated in XXI was criticized in 1925 by Gulland and Robinson as providing no explanation for the ease with which C-15 and C-16 separate in the reactions producing aromatic compounds (see (8)).[32] This elimination can only take place (and then it does so effectively) if there is a possibility of transforming the original system into a more stable phenanthrene system. Where this transformation is not possible, in the case of derivatives without a double bond, for example, or in the case of 14-hydroxycodeine, C-15 and C-16 do not separate. Hence their position must be such that aromatization is impossible without their elimination. Position 5 does not satisfy this condition.

Gulland and Robinson then proposed formula XXII

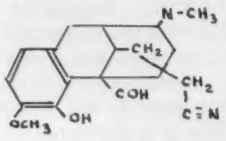


XXII

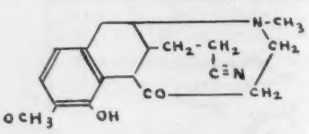
for morphine, which is the most widely accepted today.

The Gulland-Robinson formula XXII received considerable support from Schöpf's work in 1927[33] on dihydrocodeinone-oxime X. Subjected to a Beckmann rearrangement (second type) the oxime is converted into aldehyde XXIII. Knorr's formula XXI should have given the ketone XXIV.

XXIII



XXIV



II. Problems still requiring solution

This research work, together with Schöpf's discussion of the stereochemical aspect of the Gulland-Robinson formula, has established that formula more firmly than ever.

This formula, moreover, lends itself particularly well to the explanation of a large number of complex reactions of morphine and its derivatives which cannot be dealt with here.

We consider it more expedient to emphasize and discuss some of the observations which do not appear wholly to agree with the formula and which make it impossible to regard the problem of the constitution of morphine as definitively solved.

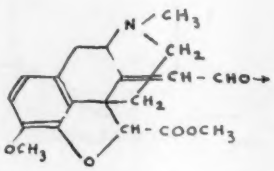
(*a*) *Pseudomorphine*

Pseudomorphine, $C_{34}H_{36}O_6N_2$, is easily obtained by a number of methods, including the oxidation in air of a solution of alkaline morphinate, and results from the coupling of two morphine molecules. On the analogy of the bimolecular products of the oxidation of naphthols, it has been suggested that pseudomorphine is a result of the union of two morphine molecules at C-1 or C-2. A symmetrical formula, however, cannot take into account the fact that one only of the resulting compound's four hydroxyls possesses the properties of a phenol (loss of the phenolic function as a result of mono-methylation).

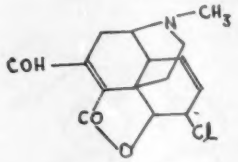
Again, the two nitrogen atoms are not identical in their properties as is shown first of all by the impossibility of adding CH_3I. Moreover, oxidation of morphine-methiodide gives the molecule $C_{17}H_{18}O_3N(CH_3)I$—$C_{17}H_{18}O_3N(CH_3)OH$, which is converted to diiodmethylate by hydriodic acid. Only one, however, of these two iodine atoms is easily eliminated by bases, the other being much more resistant (Vongerichten, Polstorff).[34] In 1934, Small[35] described the synthesis of similar products by the oxidation of morphine isomers (corresponding to the codeine isomers referred to in (9)). Of these the product derived from isomorphine shows the same peculiarities as pseudomorphine; its acetylated derivative, however, forms an iodomethylate in the normal way.

(*b*) *Ozonization*

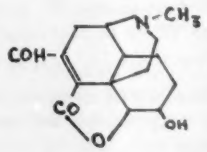
While thebaine behaves normally with ozone to give thebaizone (Pschorr[36] 1907, Wieland, Small[37] 1928), morphine and its derivatives, whether or not containing a double bond in the carbon nucleus, suffer attack on their aromatic nucleus. Thus morphine and codeine give the same aldehyde—codinal—resulting from the loss of two carbon atoms in the case of morphine, and of two carbon atoms and one methoxy group in the case of codeine.[38]



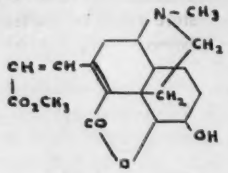
α-Chlorocodide also suffers attack on its aromatic nucleus and gives α-chlorocodinal (Wieland, Small, Speyer, Roell):



dihydromorphine similarly gives dihydrocodinal,[39]



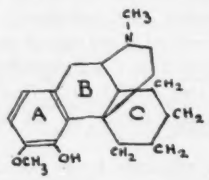
which may also result from the action of ozone on dihydrocodeine, by way of ozodihydrocodeine,[40]



It is difficult to understand why the ethylenic double bonds of morphine and codeine do not react to ozone although behaving quite normally with other agents.

(*c*) *Behaviour of tetrahydrodesoxycodeine*

This base is obtained by the reduction of a number of codeine derivatives. Although several of them are true phenols, tetrahydrodesoxycodeine itself is insoluble in the bases and cannot be acetylated, methylated or benzoylated by the usual methods.[41] This insolubility in the bases persists even after exhaustive methylation.



(*d*) *Action of Grignard reagents on certain codeine derivatives having a double bond at 6:7*

Although the points referred to in (*a*), (*b*), and (*c*) represent surprising anomalies of behaviour, the objections to which they give rise are not considerable enough to challenge the Gulland-Robinson formula. The point we are now about to discuss has not yet received any final explanation and has once more thrown doubt on that formula.

The action of Grignard reagents on morphine alkaloids was studied for the first time by Freund[42] in the case of thebaine at the beginning of this century and, more recently, by Small and his collaborators. The behaviour of thebaine, which is particularly complicated, will be considered last of all.

Generally speaking the ketones of the codeine series do not react to Grignard reagents and their possible enolisation has been suggested as an explanation of this anomaly.[43] Codeinone, for example, does not react even at 170 degrees, at which temperature a decomposition takes place. Dihydrocodeinone and dihydropseudocodeinone are also inert. Dihydrocodeinone, on the other hand, has been observed to react normally with methyllithium; it has also been noted that compounds possessing a double bond at 6:7 react abnormally to organic magnesium compounds, whether or not their molecule contains a ketonic carbonyl group.

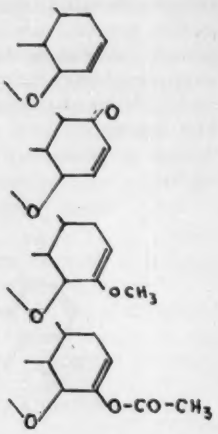
In accepting the results for thebaine which are given later, the results of the study of the following compounds have been published:

DESOXYCODEINE[44]

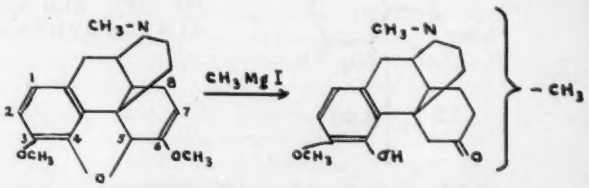
PSEUDOCODEINONE[45]

DIHYDROTHEBAINE[46, 47]

ACEDICON[46, 47]



The latter two alkaloids have the peculiarity of reacting more easily in a benzene solution than in an ether solution; whatever the magnesium reagent used, addition occurs, with saponification of the enol group and formation of two isomers. Small, for example, showed that dihydrothebaine adds methyl magnesium iodide with fissure of the oxygen bridge and formation of a phenol group, while the enol ether hydrolysis gives a ketonic carbonyl. The reaction could, as a first approximation, be written out as follows, with the emphasis that the ketone obtained is in two isomeric forms:

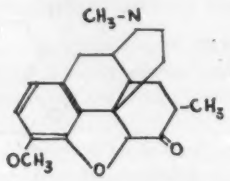


DIHYDROTHEBAINE 2 ISOMERS

The same two isomers may be obtained from dihydrocodeinone enol acetate by means of methyl magnesium iodide. Small regarded these ketonic isomers as the result of adding Grignard's reagent to the allyl system comprising the epoxyde and the double bond 6:7. It would also be possible to have a normal addition to this double bond, so that the isomers could be either the stereoisomers of the methylated ketones (*a*) at 7 or (*b*) at 5; or (*c*) the isomers of position, one of which would be ketone methylated at 5 and the other at 7. As we shall

see, there are serious objections to each of these three hypotheses.

It should be noted that the ketonic function created by the Grignard reaction has the usual properties of the ketonic carbonyls (reduction, oximation, etc.). The isomerism, however, survives, the bromination of the two isomers, followed by the action of a base. This treatment re-establishes the oxygen bridge and produces two methyldihydrocodeinones, one of which, dimethylated with hydrobromic acid gives metopon, the pharmacodynamic properties of which have aroused considerable interest:

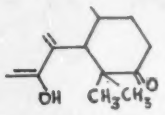


POSSIBLE FORMULA OF METOPON, AFTER SMALL

The particular objections raised by each of the three hypotheses (*a*), (*b*), and (*c*), put forward above to explain the isomerism, may be summed up as follows:

Hypothesis (*a*), that methylation takes place at 7 with formation of two diastereoisomers, must be rejected for two reasons: the two methyldihydrocodeinones react with ethyl oxalate, indicating the presence of the group -CO-OH_2-, and not of the group -CO-CH-R. (The behaviour of metopon confirms this conclusion.)

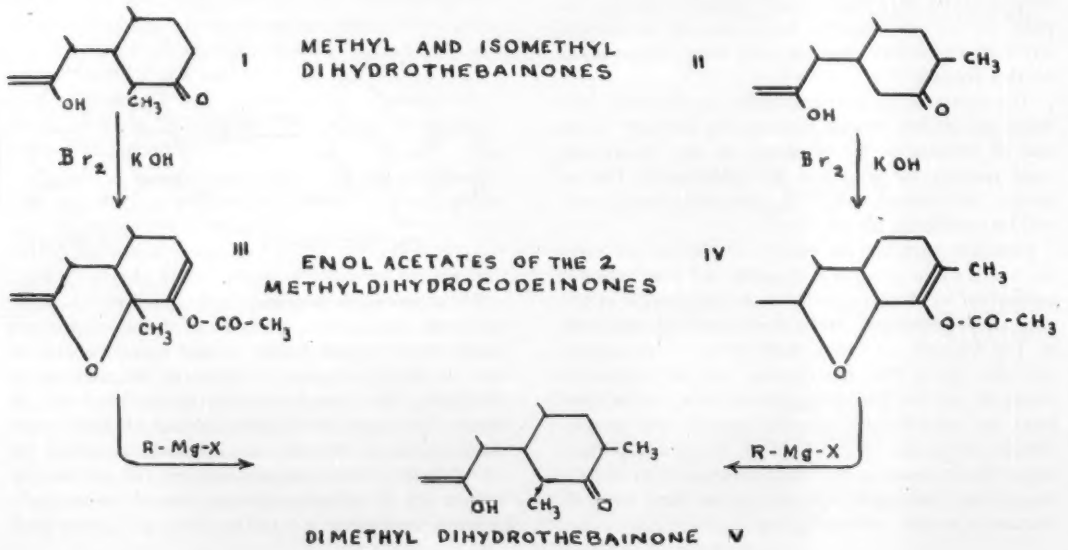
The two methyldihydrocodeinones form different enolic acetates, of which the double bond must be at 6:7, since their reaction with methyl magnesium iodide gives one and the same dimethyldihydrothebainone in each case. The latter compound is no longer able to restore its epoxyde, which could be explained if dimethylation at 5 were accepted.



We must now consider hypothesis (*b*)—that the stereoisomerism is the result of a methylated substitution at 5 in the two diastereoisomers: this would imply that the two methyldihydrothebainones should, by the action of the bromine and the bases, give the same methyldihydrocodeinone, since only a single structure at 5 is compatible with the existence of an oxygen bridge. This deduction, however, is refuted by the formation of two epoxydic isomers, as stated above.

We are thus reduced to the last of the three hypotheses, hypothesis (*c*). This is incompatible with the ethyl oxalate reaction and with the fact that it is impossible to store the oxygen bridge in the dimethyldihydrothebainone.

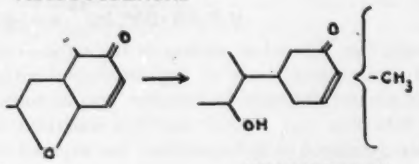
The fact that reactions I → III can be obtained shows that if the methyl is in position 5 the structure is conducive to the formation of the bridge. This favourable structure should be transmitted to V, which should thus, contrary to experience, be able to re-establish its epoxyde.



It is possible that attempts at degradation into phenanthrene derivatives may decide which of these conflicting hypotheses is correct. Nothing seems as yet to have been published on the subject, but it is possible that industrial laboratory work on metopon, as yet unpublished, has already shed some light on these complicated questions of structure. The only recent publication which suggests that the solution of the problem is on the way is that of Small,[48] who formulates metopon as a 7-methyldihydromorphinone, but does not give his reasons.

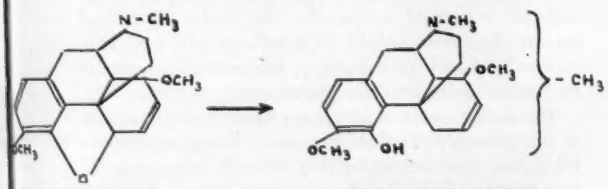
Some of the reactions between magnesium compounds and morphine derivatives which have been studied and published may be regarded as constituting the transition from the cases which have been discussed above to the even more confused case of thebaine. Methyl magnesium iodide, for example, acts on pseudocodeinone to form methyldihydropseudocodeinone, which is phenolic and should, from its composition, be the result of the addition of a methyl and of a fission of the oxygen bridge.

PSEUDOCODEINONE



METHYLDIHYDRO-PSEUDOCODEINONE

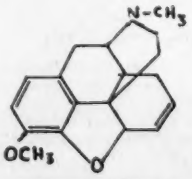
This compound, too, shows several anomalies: it is particularly resistant to hydrogenation and forms neither an oxime nor a semi- carbazone. Its analog, derived from pseudocodeine methyl ether, cannot be reduced either.



PSEUDOCODEINE METHYL ETHER

METHYLDIHYDROPSEUDO-CODEINE METHYL ETHER

As for desoxycodeine-C,



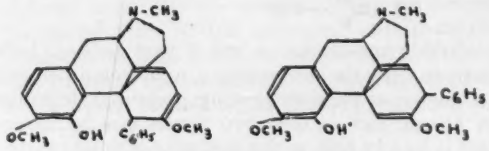
DESOXYCODEINE-C

it reacts with Grignard reagents to form phenol compounds as the result of the addition of the organic radical and fission of the organic bridge. In the case of the phenyl and the ethyl, small quantities of isomers are produced, some of which resist catalytic hydrogenation.

(*e*) *Action of Grignard reagents on thebaine*

This study was begun by Freund in the hope that it would quickly provide an explanation of the structure of thebaine and it has proved to be one of the most complicated and hermetic in the whole of organic chemistry. Not all its secrets have yet been solved, despite the substantial progress recently made.

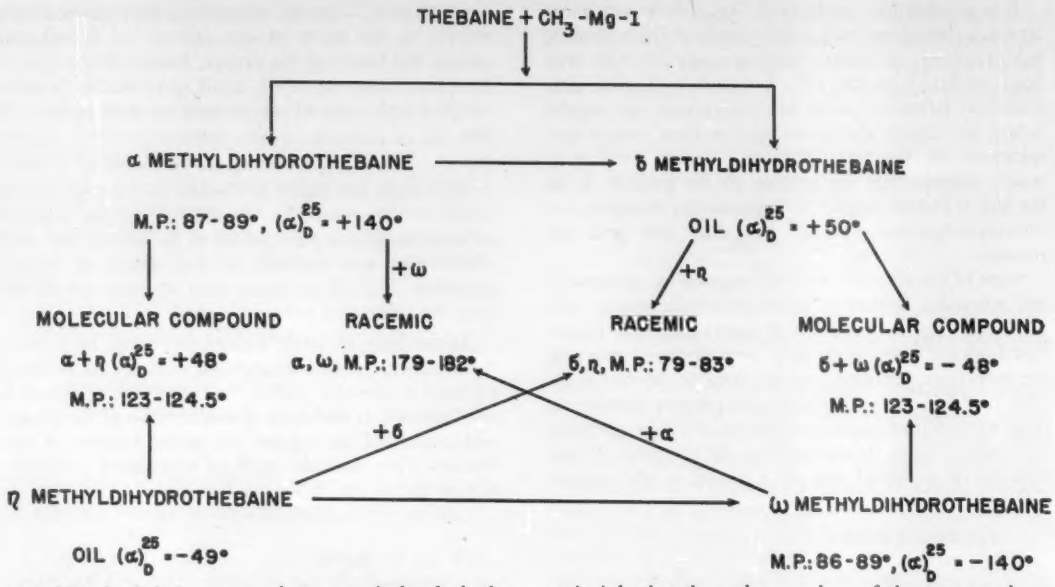
As far back as 1905, Freund succeeded, by treating thebaine with phenyl magnesium bromide, in isolating a phenol compound, phenyldihydrothebaine, which, it is now believed, is the result of the addition of the phenyl with fission of the oxygen bridge and consists of two isomers. This molecule could be represented provisionally by one of the following formulae:



This compound shows many anomalies:

The double linkages are so resistant to hydrogenation that they are unaffected by the most powerful methods; the compound is stable towards acids and bases. Boiled with acetic anhydride it gives an acetic ester, while in the same conditions thebaine is degraded into acetylthebaol. Its methyl ether does not react with ozone. One of its methoxyl groups has lost its enolic character, since it is no longer affected by boiling with hydrochloric acid. Its complete demethoxylation is possible with hydrochloric acid under pressure, but the resulting products is not ketonic, behaves like a triphenol and through the action of diazomethane, changes into phenyldihydrothebaine methyl ether. Aromatization of the carbon nucleus would account for all these characteristics, but the hydrogen content of the product would be incompatible with this hypothesis unless there have been considerable changes in the carbon skeleton. Lastly, Hofmann degradation of the phenylated (or methylated) isomers yields two isomeric methines through elimination of the nitrogen, although, curiously enough, the two carbon atoms linking the nitrogen to the original molecule are retained.

Small and Fry tried to find an explanation of this abnormal behaviour by studying the reaction between thebaine and methyl magnesium iodide. Two isomeric



methyldihydrothebaines, α and δ were isolated, both phenolic, with the same resistance to hydrogenation and acid action as the corresponding phenylated derivative of Freund: each of these two isomers may be isomerized in turn by heat, so that it is possible to get, finally, four isomeric methyldihydrothebaines, α, π, δ, ω. The methods of obtaining these isomers and their interrelations are tabulated below:

The four isomers can be seen to group themselves into two pairs of optical antipodes, implying two centres of asymmetry, and two only, in the molecule.

In 1947, Small, Sargent and Bradley published the results of studies originally designed to verify Freund's work but actually clarifying, expanding and supplementing it. The phenylated series follows the behaviour described above for the methylated series in every respect. It is possible, in particular, to isolate four isomeric phenyldihydrothebaines which are arranged in two groups of optical antipodes, and of which the Hofmann degradation is also abnormal.

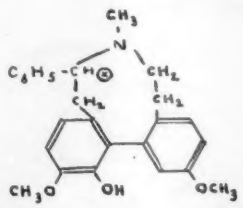
In the light of all the observations collected and after a very detailed discussion of the problem, Small first proposed a series of formulae which accurately reflect the interrelations between the various thebaine derivatives but are unable to account for their properties or their numerous anomalies. He was then led to question the validity of the Gulland-Robinson formula for morphine.

In a paper read before the Royal Society in 1947[49] Robinson suggested an unexpected and wholly original solution which would leave his formula for thebaine unaffected. Unfortunately, however, the awaited detailed publication has not yet been made. Robinson stated the principle that the carbon nucleus of the compounds resulting from the action of an organic magnesium compound on thebaine must be aromatic; this accounts for their behaviour and all their observed anomalies, such as their resistance to hydrogenation, the acquired resistance of the previously labile methoxide and the strongly phenolic character of the product of demethylation.

The products of two Hofmann degradations, in which the nitrogen is eliminated, retain their optical activity. Since it is clear, however, that none of the 24 carbon atoms remaining in the denitrified molecules (18 for the 3 nuclei, 4 to support the two double bonds and 2 belonging to the methoxy group) can possibly be asymmetrical and thus account for the continued optical activity, Robinson evolved the hypothesis of a molecular asymmetry based on a diphenyl structure of which the two nuclei are of different planes.

The second centre of asymmetry which must be present in the phenyldihydrothebaines would be an asymmetrical carbon atom belonging to a nitrogen heterocycle of nine atoms and replaced by the phenyl radical.

Robinson therefore proposed the following formula:

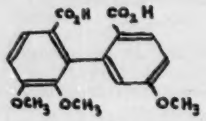


the formation of the phenyldihydrothebaines from the-

baine would follow a plausible sequence developed by Robinson. These conclusions can, of course, apply to the various products of the action of organic magnesium compounds on thebaine.

The Robinson hypothesis and formula not only provide a satisfactory explanation of what was previously regarded as anomalies, but are also in harmony with the studies made of the ultra-violet absorption of these various compounds.

It should further be noted that Robinson claims to have obtained the diphenyl acid when oxidizing the products of exhaustive methylation.



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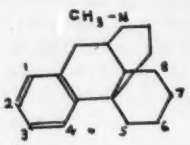
CONCLUSION

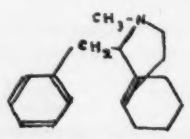
It is clear from the foregoing that the various transformations of the morphine series can, in general, be explained by using the Gulland-Robinson formula; nevertheless there remain a number of difficulties, the most important of which arise out of the study of the action of Grignard reagents.

The best proof of the validity of the Gulland-Robinson formula would be provided by a total synthesis, not of morphine or codeine, but of one of their derivatives whose method of formation is not disputed. No synthesis of this kind has yet been completed, although there are certain reliable indications that it may be expected in the near future.

Grewe's recent work is the most promising. After a series of studies of the partially hydrogenated phenanthrene derivatives, Grewe has succeeded by a highly original method of synthesis in isolating N-methyl-morphinane,



by cyclizing 1-benzyl-N-methyl-octohydroisoquinoline,



under the influence of phosphoric acid.

As we see, N-methyl-morphinane, the constitution of which has been established by Grewe, is closely related to the natural alkaloids. Tetrahydrodesoxycodeine would thus be 3-methoxy-4-hydroxy-N-methyl-morphinane.

The Hofmann-La Roche laboratories have taken a further step towards the solution of the problem by synthesizing 3-hydroxy-N-methyl-morphinane in two different ways. The sole remaining difference between the methyl ether of this compound and tetrahydrodesoxycodeine is the absence of the phenolic hydroxyl at C-4. Hence, all that remains is to eliminate this hydroxyl in the natural alkaloid or, conversely, to synthesize the molecule containing it. A direct comparison between the natural and synthetic products would be decisive.

It should be noted that racemic 3-hydroxy-N-methyl-morphinane (its separation has not yet been accomplished) is a very powerful analgesic, several times as strong as morphine.

This compound therefore deserves very special study not only because of its synthetic origin, but also for its pharmaco-dynamic properties. This study will be made in the next article which will deal with the chemistry of synthetic analgesics.

Editors' note.

At the time of going to press, we receive from the author the following information: "A highly important work has just been published in Germany by Grewe (R. Grewe, Alb, Mondon, Elisabeth Nolte: *Annalen*, vol. 564, P. 161) in which this author describes the total synthesis of racemic tetrahydrodesoxycodeine followed by its double decomposition. As isomer, as well as the synthetic racemic, have been identified with the corresponding compounds produced by the reduction of codeine, any remaining doubts as to the Gulland and Robinson formulae are now finally removed".

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Microchemical Identification of

SYNTHETIC NARCOTICS

AMIDONE[a], HEPTALGIN[b], DEMEROL[c], PIPIDONE[d]

BY CHARLES G. FARMILO,[e] R. J. ROSS,[f] STAVELY BERRY,[e] AND PATRICIA M. L. KENNETT[e]

The method of identification of organic basic compounds by means of characteristic crystals under the microscope was developed by Behrens,[2] Wormley,[13] Stevenson,[11] Fulton,[4] Amelink,[1] *et al.;* and is now conceded to be the most reliable means of identifying the pure alkaloids met with in drug analysis and toxicology. In the following article a number of photographs illustrate some characteristic crystals which may be used for identification purposes. The reagents are for the most part described in articles by the following authors: Amidone has been studied quite thoroughly by Fulton,[5] Watson and Bowman,[12] Schuldiner,[9] Lucas[8] and others; demerol by Levine,[7] Ducloux,[3] and Hanson;[6] heptalgin and "pipidone" were studied as part of a general project on the identification of narcotics being carried on at present in the Food and Drug Laboratories in Ottawa. Details of our work will be published at a later date. The pictures* nearly all represent crystals which have never been published, although the reagents may have been given previously by other workers.

EXPERIMENTAL

MATERIALS

The narcotics investigated in this paper were gifts obtained from the following sources: Amidone hydrobromide, E. B. Shuttleworth and Co. Ltd., Toronto, Canada; Heptalgin, Glaxo Laboratories Ltd., Research Division, Greenford, Middlesex, England; P.1.-S.1 ("Pipidone") Burroughs Wellcome & Co. 183-193 Euston Road, London, N.W.1, England; Demerol hydrochloride, Winthrop Chemical Co. Inc., Windsor, Ontario. These gifts are hereby gratefully acknowledged.

METHOD

The method of producing the crystals was the usual one of adding a drop of the aqueous solution of alkaloidal salt to a flat microscope slide, and then adding a drop of the appropriate reagent, sometimes mixing with a stirring rod, sometimes not. A cover glass was used, in some cases, and was placed over the alkaloid drop. The reagent drop. was then placed at the edge of the circle so that it was drawn into the alkaloid drop by capillary action. This caused faster crystal growth in solutions which had low surface tension, since spreading and rapid drying of the reaction drop on the slide were prevented.

PHOTOGRAPHY

There are one or two novel features about the photography which are worth mentioning. The conventional photographic set-up employed a Bausch and Lombe, Model L. Camera and a Spencer microscope. The ocular was a 10X normal Spencer, with a 10X objective, and in a few cases a 20X objective, with a 25⅝ in. bellows extension. The total enlargement is 275 times or 575 times. The microscope was set up for 10X objective with Kohler critical illumination for low magnification (see standard text-books). All crystals except those with a red colour were photographed with a Wratten No. 61 green filter using a Tungsten ribbon filament lamp.

A few photomicrographs made more recently than the others were taken with a zircon arc micrscope lamp in-

[a] Amidone hydrobromide : 6-dimethylamino-4,4-diphenyl-heptanone-3 hydrobromide.

[b] Heptalgin : 6-morpholinyl-4,4-diphenylheptanone-3 hydrochloride.

[c] Demerol hydrochloride, Brand of Meperidine hydrochloride: ethyl-1-methyl-4-phenylpiperidine-carboxylate.

[d] P.1.-S.1, "Pipidone" : 6-piperidine-4,4-diphenyl-5-methyl-hexanone-3 hydrochloride.

[e] Chemists employed at Organic Chemistry and Narcotic Section, Food and Drug Divisions, Department of National Health and Welfare, 35 John Street, Ottawa, Canada.

[f] Supervisor, Technical Research Department, National Film Board, Ottawa, Canada.

* The photomicrography in this paper was the work of Roger J. Ross.

stead of the ribbon filament used previously. This gave about fifty times as much light for photography, as measured on the ground glass by a Photo-volt, Model 200, sensitive light meter. The light readings for the first set were about 0.04 units, while those for the second set were about 2.0 units, both measured with the Wratten No. 61 green filter in place. The exposure time under these latter conditions was found to be about 1/25 sec.

The photos were taken on 5" x 7" super XX Kodak film developed in a modified D-76 developer for 7 minutes.

Photographs

(unless otherwise marked, the total enlargement is 275X)

Amidone (hydrobromide)

1. Solution 8 (1:400) with iodine in 10 per cent HBr (575X).
2. 1 per cent with iodine in 10 per cent HBr.
3. 0.05 per cent with $HgBr_2$ and HCl.
4. 1 per cent with Mayer's and KI.
5. 1 per cent with Bouchardat No. 1.
6. 1 per cent with Bouchardat No. 10.
7. Solution 4 (1:800) with H_2PtCl_6 and HCl.
8. Solution 8 (1:400) with gold cyanide reagent.
9. 1 per cent with $HgCl_2$.
10. 1 per cent with $HgCl_2$.
11. 1 per cent with $HgCl_2$ and NaCl and NaOAc.
12. 0.05 per cent with $HgCl_2$ and NaCl and NaOAc.
13. 1 per cent with $Hg(CN)_2$ and NaI.
14. 0.05 per cent with $Hg(CN)_2$ and NaI.
15. 1 per cent with $FeCl_3$ in HCl.
16. 1 per cent with $FeCl_3$ in HCl.
17. 1 per cent with UO_2Cl_2 and HCl.
18. 1 per cent with UO_2Cl_2 and HCl.
19. 1 per cent with zinc hydrobromic acid.
20. 1 per cent with zinc hydrobromic acid (575X).
21. 1 per cent with NH_4ClO_4 (575X).

Heptalgin

22. 2 per cent with stannous H Bromide.

Demerol (hydrochloride)

23. 2 per cent with Dragendorff's reagent.
24. 0.4 per cent with Reinecke's salt.
25. 2 per cent with $K_3Fe(CN)_6$.
26. With H_2PtCl_6.

"Pipidone"

27. 1 per cent with Millon's reagent.
28. 1 per cent with Millon's reagent.

Results and conclusions

Most of the crystals given are very easily obtained, and are examples of the kind of microchemical reaction that can be used for identification of these and similar compounds. However, only one crystal test was discovered for "Pipidone", the one with Millon's reagent which is pictured. Amidone has now been thoroughly studied by different investigators, and Demerol fairly well. Further work is being carried on with the compounds Heptalgin and "Pipidone".

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[4] Fulton, C. C., *American Journal of Pharmacy, 112,* 1-35 (1940); *ibid., 104,* 244-271 (1932).

[5] Fulton, C. C., "Identification of Methadone by Microcrystals" United Nations document E/CN.7/117, pp. 17-31, 27 Feb. 1948.

[6] Hanson, Arne, *Svensk Kemisk Tidskrift, 58,* 10-23 (1946).

[7] Levine, Joseph, *Industrial and Engineering Chemistry,* Analytical Edition, *16,* 408-10 (1944).

[8] Lucas, G. H. W., *Detection of Amidone,* Dept. of Pharmacology, University of Toronto, Canada.

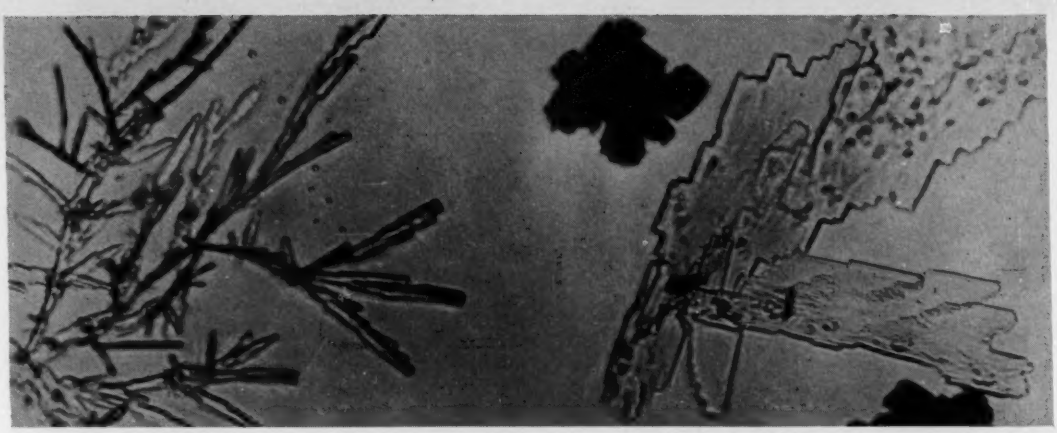
[9] Schuldiner, Jacob A., *Analytical Chemistry, 21,* 298-300 (1949).

[10] Shillaber, C. P., *Photomicrography in Theory and Practice,* John Wiley and Sons, New York, 1944, pp. 93, 730.

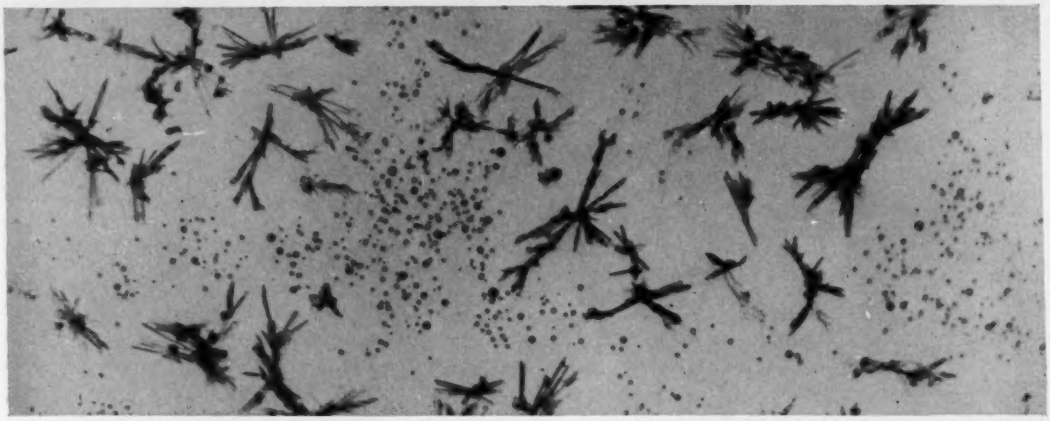
[11] Stevenson, C. H., *Some Microchemical Tests for Alkaloids,* J. B. Lippincott Co. Philadelphia, 1921.

[12] Watson, R. C., and Bowman, M. I., *Journal of the American Pharmaceutical Association, 38,* 369-373 (1949).

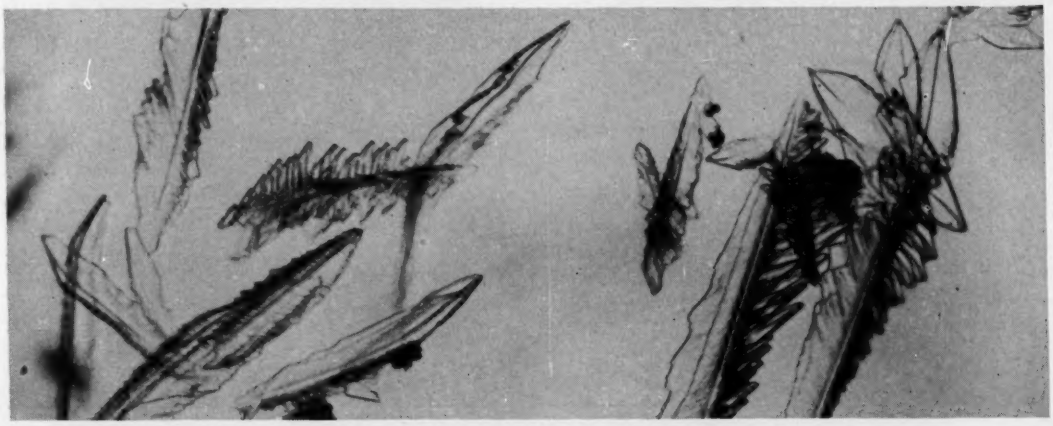
[13] Wormley, T. G., *Microchemistry of Poisons,* Philadelphia, 1869.



1. *Amidone with iodine in 10 per cent hydrobromic acid. Shows the three types of crystals that form in the same test drop: deep red grains, pale yellow plates, and white flakes (high magnification)*

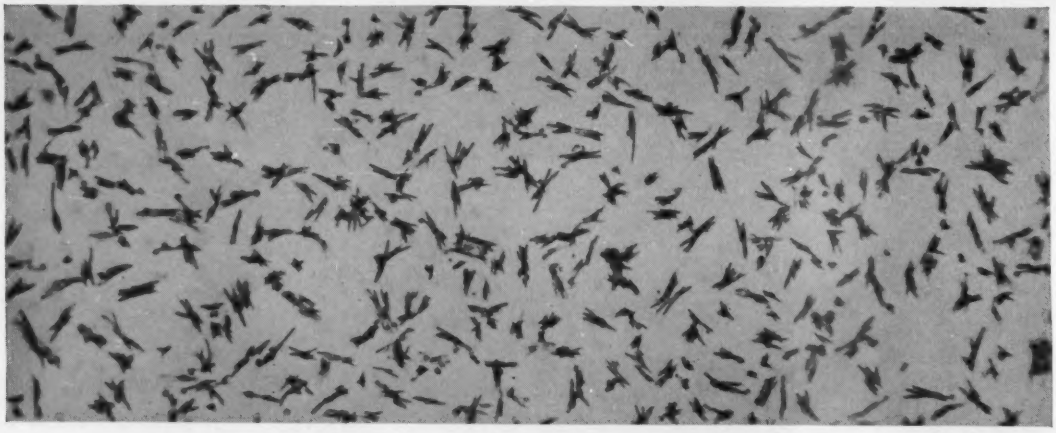


2. *Amidone with iodine in 10 per cent hydrobromic acid. Shows the white flakes (the prevalent type of crystal with this reagent) forming from the amorphous precipitate*

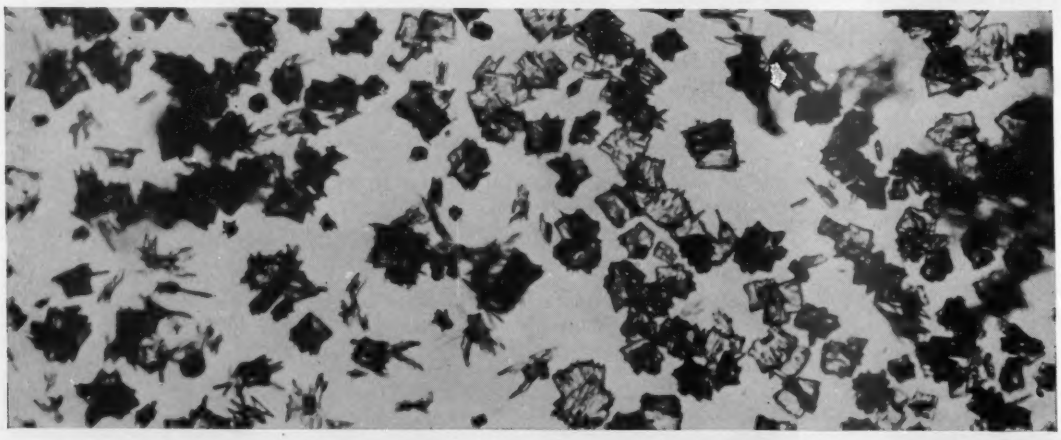


3. *Amidone with mercuric bromide and hydrochloric acid. Colourless-white feathered plates*

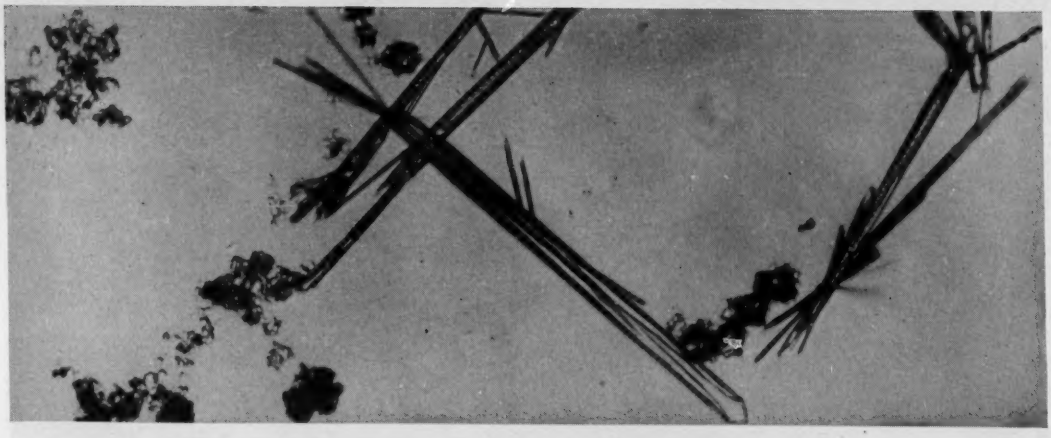
4. Amidone with Mayer's and potassium iodide



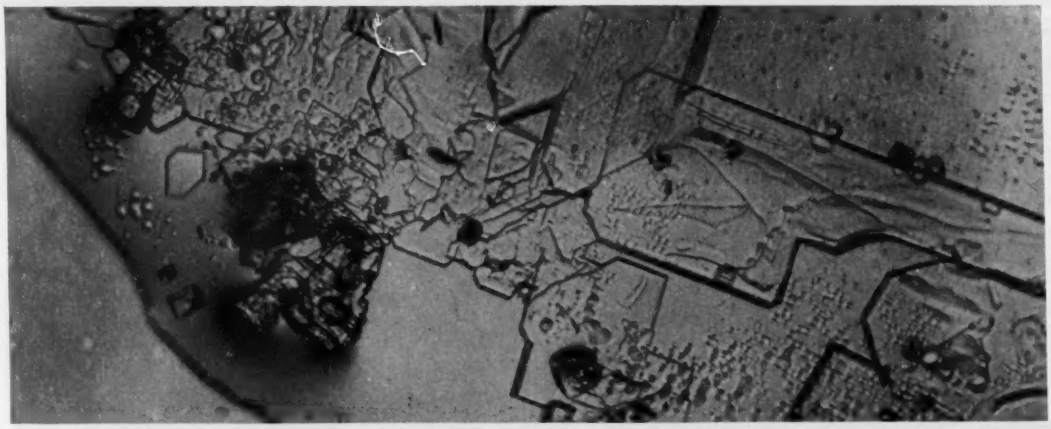
5. Amidone with Bouchardat Reagent No. 1



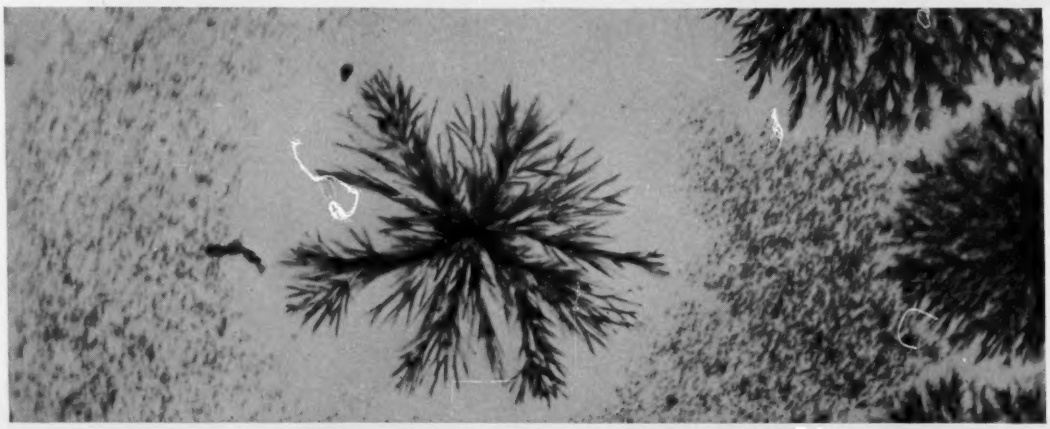
6. Amidone with Bouchardat Reagent No. 10. The appearance is characteristic of a moderately concentrated amidone solution (1 per cent in this case); the squarish grains are due to the potassium iodide of the reagent



7. Amidone with chloroplatinic acid and hydrochloric acid. Shows the two kinds of crystals that form in the same test drop

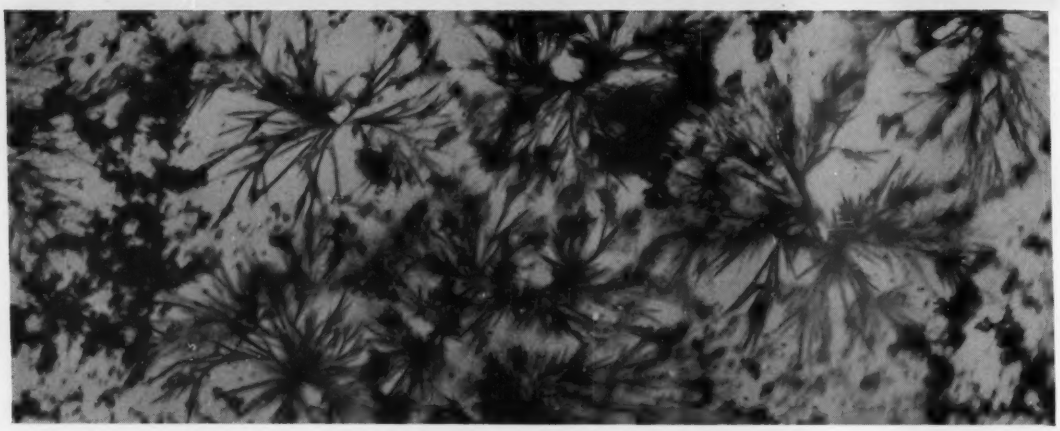


8. Amidone with gold cyanide reagent

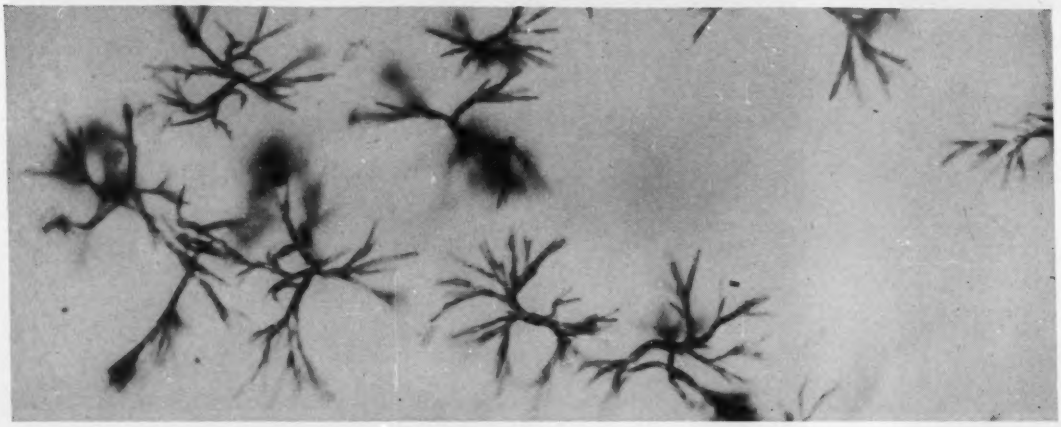


9. Amidone with mercuric chloride. Shows crystal-groups forming from the amorphous precipitate

10. *Amidone with mercuric chloride. Crystallization further advanced*



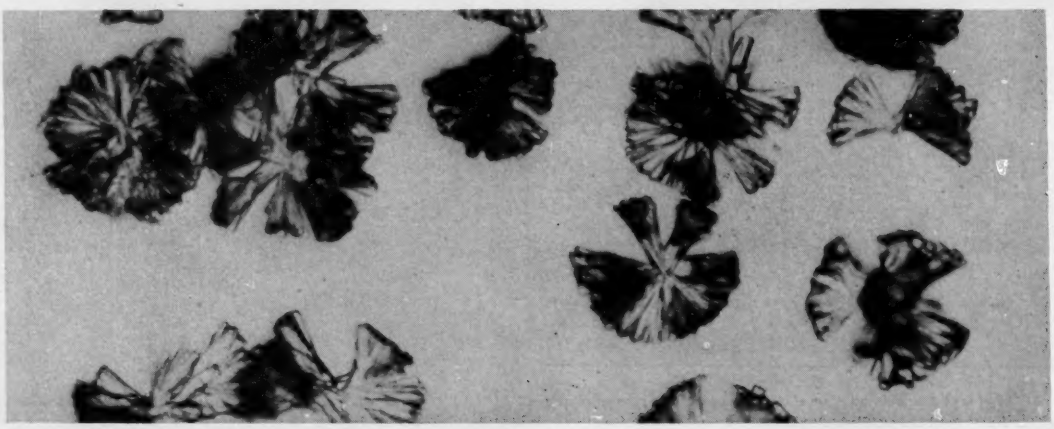
11. *Amidone (1 percent) with mercuric chloride, sodium chloride and sodium acetate*



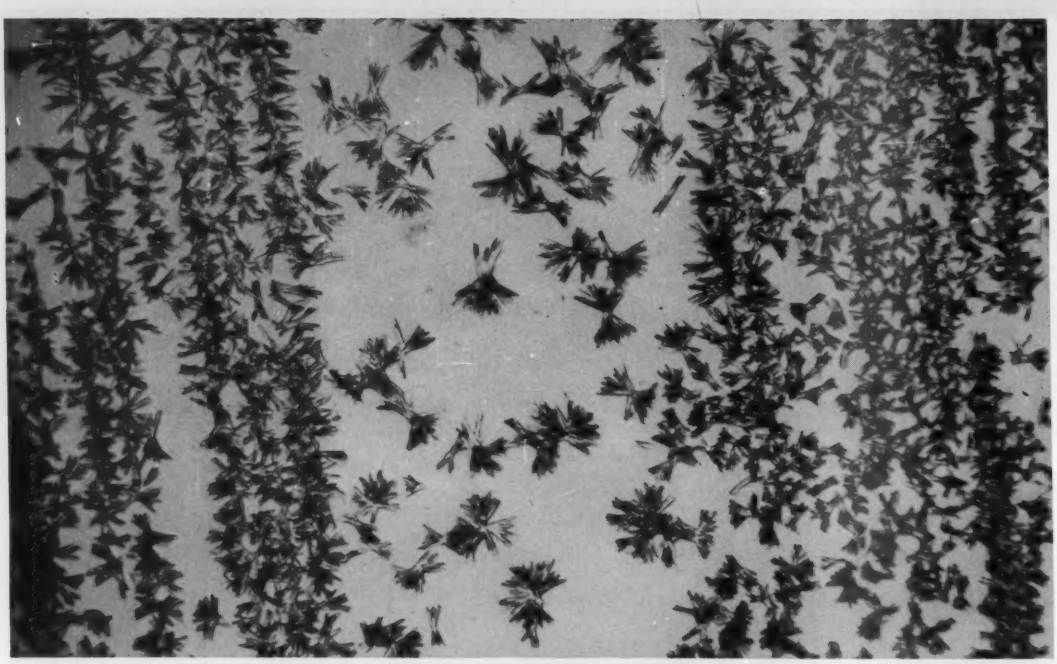
12. *Amidone (0.05 per cent) with mercuric chloride, sodium chloride and sodium acetate*

13. *Amidone (1 per cent) with mercuric cyanide and sodium iodide*

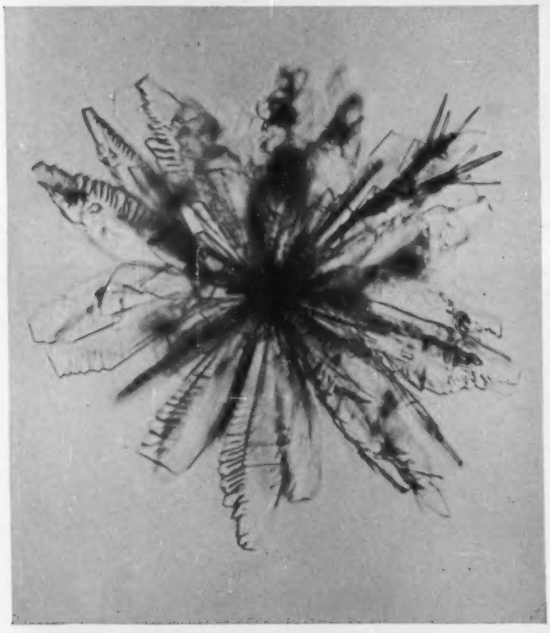
14. *Amidone (0.05 per cent) with mercuric cyanide and sodium iodide*



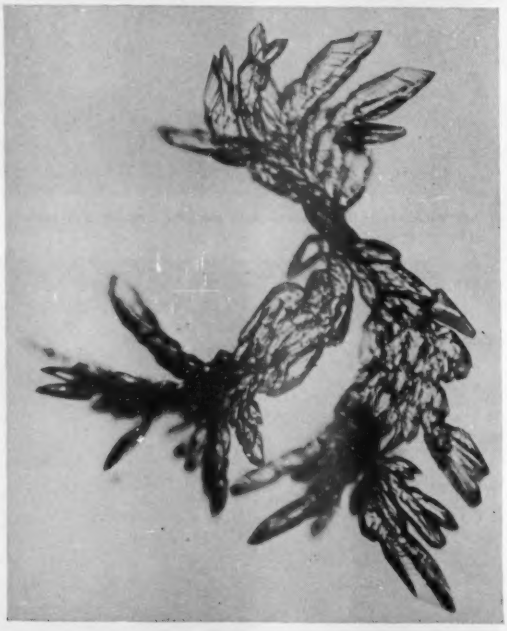
15. *Amidone with ferric chloride in hydrochloric acid. Brown yellow crystals*



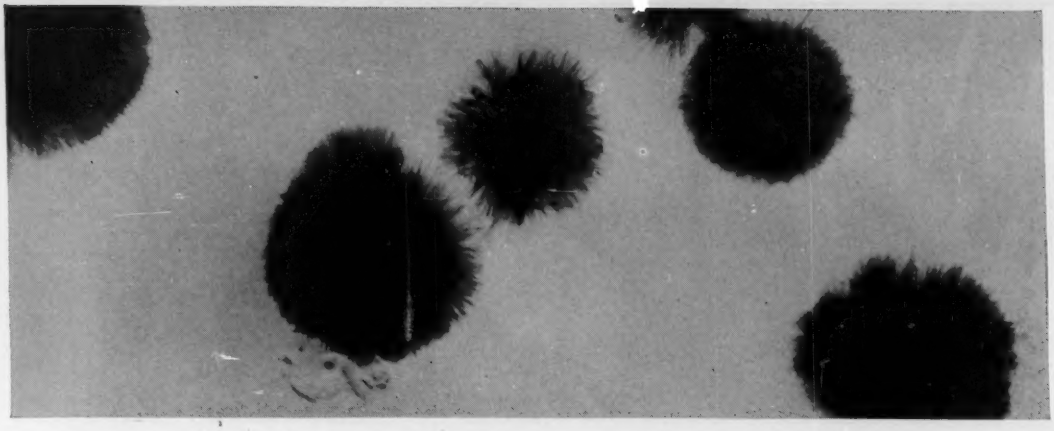
16. *Amidone with ferric chloride in hydrochloric acid. A slightly different type of crystal formation*



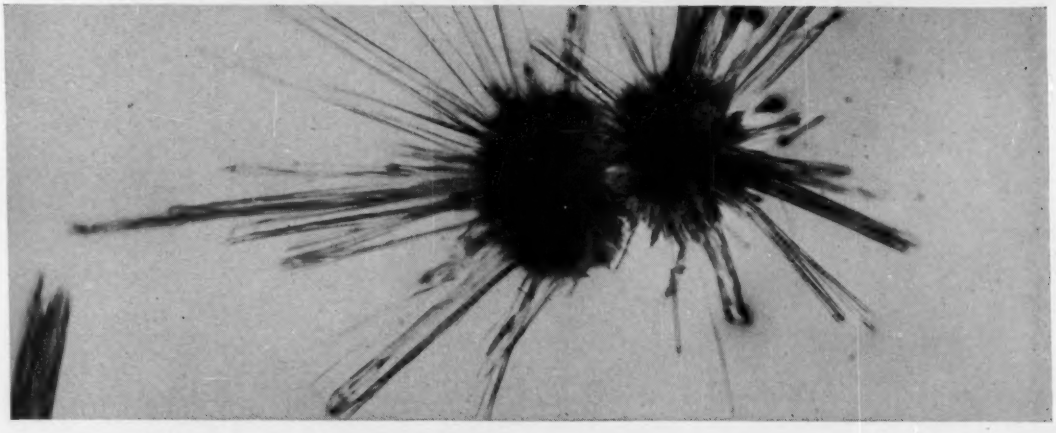
17. *Amidone with acid uranium chloride reagent. This type of crystal forms in nearly round rosettes of plates*



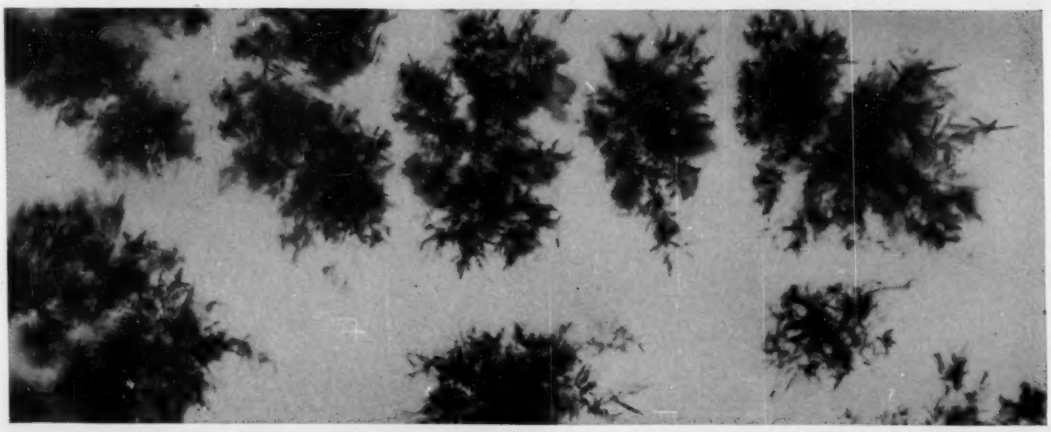
18. *Amidone with acid uranium chloride reagent. These irregular straggling crystals form in the same test drop as the rosette crystals of the preceding picture. Both types are large, yellow-coloured crystals.*



19. Amidone with zinc hydrobromic acid

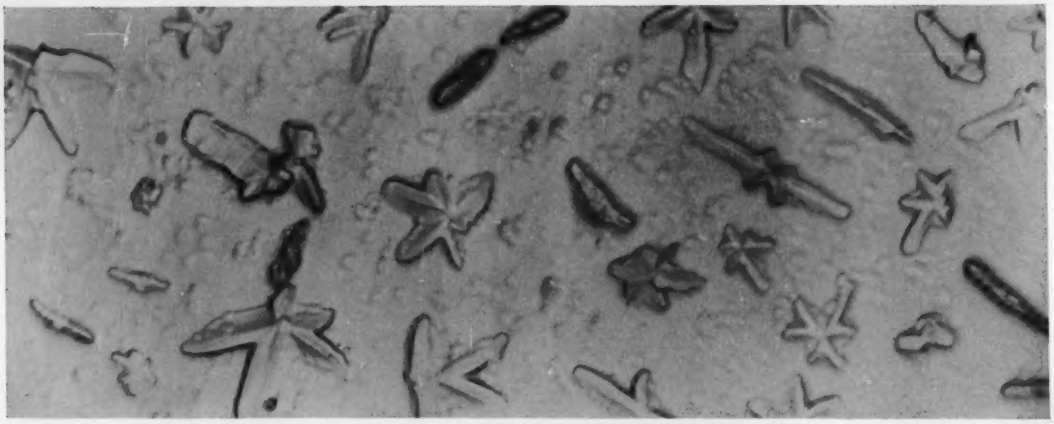


20. Amidone with zinc hydrobromic acid. A group of crystals under high magnification



21. Amidone with ammonium perchlorate (high magnification)

22. *Heptalgin with acid stannous bromide*

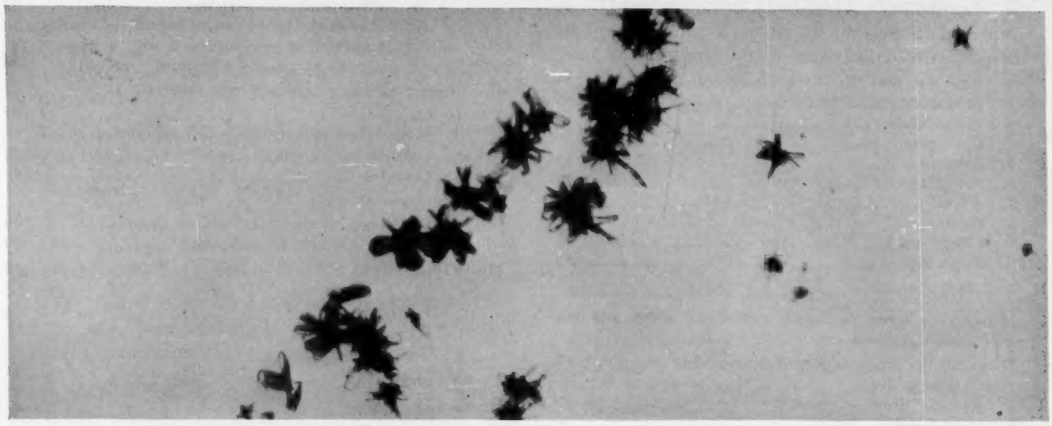


23. *Demerol with Dragendorff's reagent*

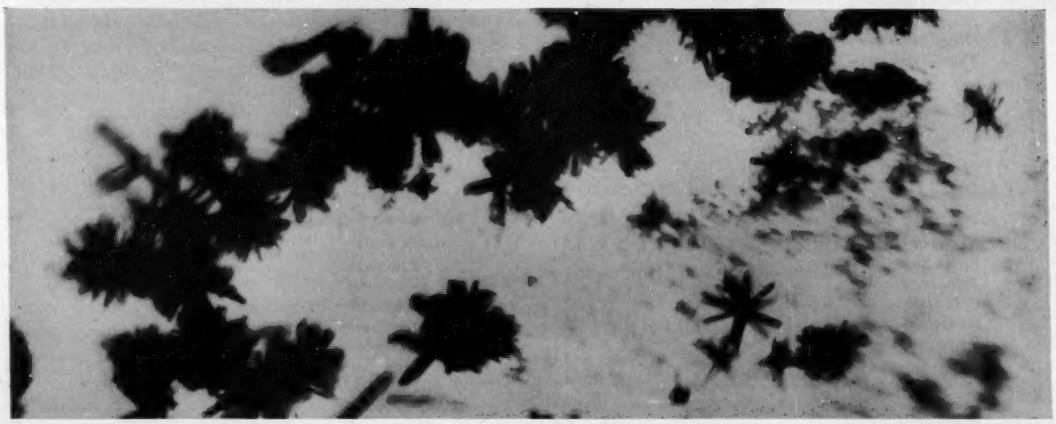
24. *Demerol with Reinecke's salt*

25. *Demerol with potassium ferricyanide* (see cut on page 21).

26. *Demerol with chloroplatinic acid (this picture supplied by the Secretariat)*



27. *"Pipidone" with Millon's reagent*



28. *"Pipidone" with Millon's reagent*

OFFICIAL SECTION

Unification of Conventions on Narcotic Drugs[a]

SCOPE OF THE CONVENTION: DEFINITIONS

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[a] See Bulletin on Narcotics. Vol. II. No. 1.

Part I

MOST IMPORTANT CURRENT DEFINITIONS

A. Definitions or Statements of the Drugs subject to International Control

The drugs subject to international control have been stated in four ways:

1. By specific enumeration of the individual drugs (Conventions of 1912, 1925, and 1931);

2. (*a*) By inclusion of certain definite chemical classes in the enumeration: "other esters of morphine," "other ethers of morphine," "their esters" (of five drugs of group I (*a*) (iv)), "the morphine-N-oxide derivatives and the other pentavalent nitrogen morphine derivatives," and "all the esters of ecgonine," as well as all the various salts of the enumerated drugs (1931 Convention);

(*b*) By inclusion of natural chemical classes in a special article: "the phenanthrene alkaloids of opium" and "the ecgonine alkaloids of coca leaf" (article 11, 1931 Convention).

3. By providing for control over other drugs having similar ill-effects to those already enumerated.

(*a*) "Liable to similar abuse and productive of like ill-effects" (1912 Convention, article 14 (*b*)).

(*b*) "Liable to similar abuse and productive of similar ill-effects" (1925 Convention, article 10).

(*c*) "Liable to the same kind of abuse and productive of the same kind of harmful effects" (1948 Protocol, article 1, paragraph 1).

4. By defining the drugs to be covered as drugs of addiction: "product . . . capable of producing addiction or . . . convertible into a drug capable of producing addiction" (article 11, paragraph 6, 1931 Convention); "drugs . . . capable of producing addiction" (preamble of the 1948 Protocol); "drug . . . capable of producing addiction or of conversion into a product capable of producing addiction" (article 1, paragraph 2 of the 1948 Protocol).

B. Primary Natural Products ("Raw Materials")

1. *Opium*

(*a*) " 'Raw opium' means the spontaneously coagulated juice obtained from the capsules of the *Papaver somniferum* L., which has only been submitted to the necessary manipulations for packing and transport, whatever its content of morphine" (1931 and 1925 Conventions).

(*b*) " 'Medicinal opium' means raw opium which has undergone the processes necessary to adapt it for medicinal use in accordance with the requirements of the national pharmacopoeia, whether in powder form or granulated or otherwise or mixed with neutral materials" (1931 and 1925 Conventions).

(*c*) "By 'prepared opium' is understood: the product of raw opium, obtained by a series of special operations, especially by dissolving, boiling, roasting, and fermentation, designed to transform it into an extract suitable for consumption. Prepared opium includes dross and all other residues remaining when opium has been smoked" (1912 Convention).

2. *Poppy plant material*

"The term 'poppy plant' shall denote any portion of the plant of the *Papaver somniferum* L., green or dry, whether capsules, leaves or stalks, which may be used for the extraction of drugs or for medical and scientific purposes other than the manufacture of drugs" (1939 Draft).[1]

3. *Coca leaves*

" 'Coca leaf' means the leaf of the *Erythroxylon Coca* Lamarck and the *Erythroxylon novogranatense* (Morris) Hieronymous and their varieties, belonging to the family of Erythroxylaceae and the leaf of other species of this genus from which it may be found possible to extract cocaine, either directly or by chemical transformation" (1931 and 1925 Conventions).

4. *Cannabis*

" 'Indian Hemp' means the dried flowering or fruiting tops of the pistillate plant *Cannabis sativa* L., from which the resin has not been extracted, under whatever name they may be designated in commerce" (1925 Convention, article 1).

C. Manufactured Drugs

1. " 'Morphine' means the principal alkaloid of opium having the chemical formula $C_{17}H_{19}O_3N$" (1931 and 1925 Conventions).

2. " 'Diacetylmorphine' means diacetylmorphine (diamorphine, heroin) having the formula $C_{21}H_{23}O_5N$ ($C_{17}H_{17}(C_2H_3O)_2O_3N$)" (1931 Convention). Dia-

[1] "Draft of the Principal Articles which might be embodied in a Convention for Limiting and Controlling the Cultivation of the Opium Poppy and the Production of Raw Opium and Controlling other Raw Materials used in the Manufacture of Opium Alkaloids", O.C./Confidential/46 (b).

cetylmorphine is also defined by implication as an ester of morphine (group I (*a*) (ii). 1931 Convention).

3. "'Cocaine' means methyl-benzoyl laevo-ecgonine ([α] D20° = —16°4 in 20 per cent solution of chloroform) of which the formula is $C_{17}H_{21}O_4N$" (1931 and 1925 Conventions).

4. "'Ecgonine' means laevo-ecgonine [α] D20° = —45°6 in 5 per cent solution of water), of which the formula is $C_9H_{15}O_3N.H_2O$, and all the derivatives of laevo-ecgonine which might serve industrially for its recovery" (1931 and 1925 Conventions).

5. "The following drugs are defined by their chemical formulas as set out below:

"Dihydrohydrooxycodeinone, $C_{18}H_{21}O_4N$;

"Dihydrocodeinone, $C_{18}H_{21}O_3N$;

"Dihydromorphinone, $C_{17}H_{19}O_3N$;

"Acetyldihydrocodeinone or Acetyldemethylodihydrothebaine, $C_{20}H_{23}O_4N$, $(C_{18}H_{20}(C_2H_3O)O_3N)$;

"Dihydromorphine, $C_{17}H_{21}O_3N$;

"Morphine-N-Oxide, $C_{17}H_{19}O_4N$;

"Thebaine, $C_{19}H_{21}O_3N$;

"Methylmorphine (codeine), $C_{18}H_{21}O_3N$, $(C_{17}H_{18}(CH_3O)O_2N)$;

"Ethylmorphine, $C_{19}H_{23}O_3N$, $(C_{17}H_{18}(C_2H_5O)O_2N)$;

"Benzylmorphine, $C_{24}H_{25}O_3N$, $(C_{17}H_{18}(C_7H_7O)O_2N)$." (1931 Convention)

Several of these drugs are also defined, in effect, in terms of the known commercial products, in group I (*a*) (iv):

"Dihydrohydrooxycodeinone (of which the substance registered under the name of eucodal is a salt);

"Dihydrocodeinone (of which the substance registered under the name of dicodide is a salt);

"Dihydromorphinone (of which the substance registered under the name of dilaudide is a salt);

"Acetyldihydrocodeinone or acetyldemethylodihydrothebaine (of which the substance registered under the name of acedicone is a salt);

"Dihydromorphine (of which the substance registered under the name of paramorphan is a salt);

"Morphine-N-oxide (registered trade name genomorphine)" (1931 Convention).

In addition, morphine-N-oxide is further defined, by implication, as a "pentavalent nitrogen morphine derivative" (group I (*a*) (iv)); and benzylmorphine, methylmorphine, and ethylmorphine as "ethers of morphine" (group I (b)). (1931 Convention.)

6. Other addiction-forming drugs manufactured from phenanthrene alkaloids of opium.

(*a*) Dihydrocodeine, $C_{18}H_{23}O_3N$. (Known commercially as paracodine) This substance was omitted, apparently by inadvertence, from the 1931 Convention.

(*b*) Acetyldihydrocodeine, $C_{20}H_{25}O_4N$, $(C_{18}H_{22}O_2N(O\ CO\ CH_3))$. A trade name of the hydrochloride is acetylcodone.

(*c*) Methyldihydromorphinone. $C_{18}H_{21}O_3N$ (known as metopon).

7. Synthetic addiction-forming drugs.

(*a*) 1-methyl-4-phenylpiperidine-4-carboxylic-acid ethyl ester (known as dolantin, demerol, pethidine, and by other names).

(*b*) Other drugs of the "dolantin" type: 1-methyl-4-metahydroxyphenyl-piperidine-4-carboxylic-acid ethyl ester (known as bemidone); 1-methyl-4-metahydroxyphenyl-4-propionyl-piperidine (known as keto-bemidone); α-1, 3-dimethyl-4-phenyl-4-propionoxy-piperidine (known as NU-1196); β-1,3-dimethyl-4-phenyl-4-propionoxy-piperidine (known as NU-1779).

(*c*) 4,4-diphenyl-6-dimethylamino-heptanone-3 (known as amidone, methadon, and by other names).

(*d*) Other drugs of the "amidone" type: 4,4-diphenyl-5-methyl-6-dimethylamino-hexanone-3 (known as isoamidone, isomethadone, etc.); 4,4-diphenyl-6-dimethylamino-heptanol-3; 4,4-diphenyl-6-dimethylamino-3-acetoxy-heptane; 4,4-diphenyl-6-morpholino-heptanone-3 (known as C.B.11).

The World Health Organization has recommended that these drugs be put under the control of the 1948 Protocol.[2]

D. Definitions of Certain Terms

1. *Raw materials*

Not defined in the conventions, but the official commentary on the 1931 Convention gives the following:

"The term 'raw material' covers raw opium or opium in any form (medicinal, prepared, etc.), poppy straw or any part of the poppy plant or coca leaves or any other substance from which any of the drugs may be produced."[3]

This definition, however, applies, in full, only to the 1931 Convention.

2. *Production*

Not formally defined in the conventions, but now commonly used as applying only to the production of "raw materials", or primary natural products, excluding manufactured drugs. There is an indirect and incom-

[2] Document WHO/HFD/9, 10 February 1949.

[3] *Historical and Technical Study of the 1931 Convention*, p. 200.

plete definition in the 1936 Convention, article 1, in connexion with "extraction" (see 5, below).

3. *Manufacture*

Not formally defined in full. "The term 'manufacture' shall include any process of refining" (1931 Convention).

4. *Conversion*

"The term 'conversion' shall denote the transformation of a drug by a chemical process, with the exception of the transformation of alkaloids into their salts. When one of the drugs is converted into another of the drugs this operation shall be considered as conversion in relation to the first-mentioned drug and as manufacture in relation to the other" (1931 Convention).

5. *Extraction*

"For the purposes of the present Convention the word 'extraction' connotes an operation whereby a narcotic drug is separated from the substance or compound of which it forms part, without involving any actual manufacture or conversion properly so called. This definition of the term 'extraction' is not intended to include the processes whereby raw opium is obtained from the opium poppy, these being covered by the term 'production'" (1936 Convention).

6. *Estimates*

"The term 'estimates' shall denote estimates furnished in accordance with articles 2 to 5 of this Convention, and, unless the context otherwise requires, shall include supplementary estimates" (1931 Convention).

7. *Stocks*

(*a*) "The term 'reserve stocks' in relation to any of the drugs shall denote the stocks required (i) for the normal domestic consumption of the country or territory in which they are maintained, (ii) for conversion in that country or territory, and (iii) for export" (1931 Convention).

(*b*) "The term 'Government stocks' in relation to any of the drugs shall denote stocks kept under Government control for the use of the Government and to meet exceptional circumstances" (1931 Convention).

8. *Derivative*

The Committee of Experts of the 1931 Conference unanimously decided that in scientific language the English term "derivative" signifies group-or-series-relationships and not necessarily the origin.[4]

This is clearly the meaning in "the morphine-N-oxide derivatives, and other pentavalent nitrogen morphine derivatives" (French in this case *composés*, not *dérivés*) and in "all the derivatives of laevo-ecgonine which might serve industrially for its recovery" (1931 Convention).

9. *Compound*

The noun "compound" is used in the plural in article 13,2(*b*), of the 1931 Convention, with the meaning "pharmaceutical preparations." In the preamble to the 1948 Protocol the phrase "compounds containing these drugs" is used in addition to "their preparations." In Article 1,2 of the 1936 Convention "compound" is used, in the singular, in addition to "substance", in defining "extraction" (see 5, above). The meaning is not clear in either of these last two cases. The French texts use three different terms. (For discussion of the texts, see part II, D, 9.)

10. *Preparation*

There is no formal definition of this term, but at first glance it appears to be used in its ordinary pharmaceutical sense throughout. Closer examination shows two exceptions. In the 1925 Convention, article 11, the term at first appears to have the pharmaceutical meaning, but the examples given between parentheses are simply names for the crude resin of Cannabis, no more pharmaceutical "preparations" than opium is. This usage will be discussed fully in part II,B,4. In the 1931 Convention, article 1,2, "preparations made directly from raw or medicinal opium and containing more than 20 per cent of morphine" might at first be taken to refer to exceptionally strong pharmaceutical preparations. However, reference to the discussions and the commentary[5] shows that the phraseology was intended to *exclude* the ordinary pharmaceutical preparations made by solution, percolation, mixing, etc., and to take in, instead, manufactured drugs of the pantopon type. While these last can be called "preparations" by using the term in its broadest sense, they are not "preparations" of opium in the sense of being prepared from opium by simple pharmaceutical processes. They are manufactured drugs just as much as morphine itself, and they are not made "directly" from opium in any very different sense from morphine itself.

Aside from article 1, the term "preparation" signifies in the 1931 Convention pharmaceutical preparations made from the manufactured drugs of article 1. However, this Convention introduced great complications of classification. In the 1925 Convention, aside from article 11, the classification was fairly simple. The 1931 Convention produced a different and more complicated

[4] Records of the 1931 Conference, vol. II, p. 133, annex 9.

[5] *Historical and Technical Study*, pp. 36, 37.

system, and at the same time tried to combine it with the system of the 1925 Convention, excluding Indian hemp and the ordinary pharmaceutical preparations made directly from opium. The resultant confusion is instructive, not only with respect to the meaning of "preparation", but also in regard to some other definitions. The following analysis is therefore presented.

Preparations of the 1931 Convention

A. MADE "DIRECTLY" (OR "DIRECT") FROM OPIUM OR COCA LEAF

(a) Defined as "drugs"; subject to full control

1. So-called "preparations" containing over 20 per cent of morphine; actually manufactured drugs of the pantopon type.

2. Ordinary pharmaceutical preparations made from coca leaf and containing over 0.1 per cent of cocaine.

B. PREPARATIONS MADE FROM "THE DRUGS"

(a) Subject to some further control

(i) Made from group I drugs

3. Preparations containing more than 0.2 per cent of morphine or more than 0.1 per cent of cocaine and all preparations of other group I drugs, when not exempted by article 8 of the 1925 Convention, are subject to the provisions of the 1925 Convention by its article 4 and by article 13, 1 (*a*), of the 1931 Convention; preparations containing 0.2 per cent, or less of morphine or 0.1 per cent or less of cocaine and coming under article 13, 1 (*b*), of the 1931 Convention, are also subject to the same provisions. (Preparations of diacetylmorphine not exempted under article 8 fall in this class as far as it goes, but constitute another class by reason of special provisions.)

4. Preparations of diacetylmorphine:

(*a*) Preparations not exempted under article 8 are subject to the controls of the 1925 Convention and also to the special restrictions of article 10 of the 1931 Convention;

(*b*) Preparations exempted under Article 8 of the 1925 Convention [6] are possibly still subject to control in international trade for signatories of the 1931 Convention, notwithstanding the language of article 13, 1 (*a*), because article 10, providing a special regime for diacetylmorphine and its preparations, makes no provision for exemptions.

(ii) Made from group II drugs

5. Preparations not adapted to normal therapeutic use, are subject only to the provisions of chapter V of the 1925 Convention, by article 13, 2 (*b*), of the 1931 Convention (article 13, 2 (*c*), of the 1931 Convention seems not to apply to preparations, although the exemption of article 13, 2 (*c*) (ii) does not include all the paragraphs mentioned).

(b) Exempted from further control when made

6. (*i*) Preparations containing 0.2 per cent or less of morphine or 0.1 per cent or less of cocaine, except those included in class 3 above by article 13, 1 (*b*), of the 1931 Convention.

(*ii*) "Compounds" of group II drugs adapted to a normal therapeutic use, exempted by article 13, 2 (*b*), of the 1931 Convention (article 13, 2 (*c*), seems not to apply to preparations, although the exemption of article 13, 2 (*c*) (ii), does not include all the paragraphs mentioned).

(*iii*) Preparations exempted under article 8 of the 1925 Convention, except the heroin preparations.[7] (Notwithstanding the language of article 13, 1 (*a*), of the 1931 Convention, these diacetylmorphine preparations are probably still subject to control for signatories of the 1931 Convention because of the special regime established by its article 10.)

Preparations of the 1925 Convention not included in the 1931 Convention

A. INDIAN HEMP PREPARATIONS (SUBJECT TO CONTROL)

(a) Preparations of pharmaceutical type

7. "Galenical preparations" (extract and tincture) of Indian hemp (article 4 (*f*); also preparations having extract or tincture of Indian hemp as a base, reserving certain exemptions.[8]

(b) So-called "preparations"

8. "Preparations" of article 11, 1: "the resin prepared from it (Indian hemp)"; "ordinary preparations of which the resin forms the base (such as hashish, esrar, chiras, djamba)"; actually the crude resin.

B. OPIUM PREPARATIONS (SUBJECT TO CONTROL)

9. Preparations made directly from raw or medicinal opium and containing over 0.2 per cent but not over 20 per cent of morphine. These are held to fall under article 4 (*d*) of the 1925 Convention, when made by legitimate manufacturers, but not under article 13, 1 (*a*) of the 1931 Convention.

[6] See document C.114.M.54.1932.III.
[7] *Ibid.*
[8] See article 10 of the 1925 Convention and document C.L. 161.1939.XI.

Preparations outside the scope of the 1931 and the 1925 Conventions

A. NOT COVERED BY ANY CONVENTION

Preparations made from opium, coca leaf, or Indian hemp, but wholly exempt

10. (i) Preparations made directly from opium or coca leaf and containing 0.2 per cent or less of morphine or 0.1 per cent or less of cocaine; *except* that: (*a*) if a preparation is made from medicinal opium rather than raw opium the material is subject to the 1925 Convention; (*b*) if any preparations are merely dilute solutions or simple dilutions of opium or coca leaf extract they *may* come under article 13, 1 (*b*), of the 1931 Convention, though this is not clear.

(ii) Indian hemp preparations for external use; exemption reserved.[9]

B. SUBJECT TO THE 1948 PROTOCOL

11. "Preparations and compounds containing these drugs" are included with the drugs brought under control in the preamble of the 1948 Protocol, and are not thereafter mentioned separately.

Part II

CONSIDERATION OF TERMS FOR ADDICTION-FORMING DRUGS, AND THE TEXT OF OTHER DEFINITIONS

A. Terms for the Drugs subject to International Control

Many attempts have been made to use some single term or fairly short expression to name or delimit the drugs requiring international control.

Chief of these are: (1) dangerous drugs; (2) narcotic drugs; narcotics; (3) habit-forming drugs; (4) *stupéfiants* (French); (5) opiates; (6) drugs capable of producing toxicomania, or narcomania; (7) addiction-forming drugs; drugs of addiction; (8) "the drugs" (specified); (9) the substances specified.

1. *Dangerous drugs*

Used in: (*a*) title of the "Advisory Committee on Traffic in Opium and Other Dangerous Drugs" of the League of Nations; (*b*) resolution of the Tenth Assembly of the League of Nations which called for the 1931 Conference; (*c*) title of the 1936 Conference and Convention; (*d*) often in national legislation.

This term conveys nothing as to why certain drugs are dangerous in such a way as to require international control. It has the advantage of possibly being applicable to drugs that are dangerous only because convertible into addiction-forming drugs. Its use in national legislation sometimes extends beyond the drugs under international control.

2. *Narcotic drugs*

Used in (*a*) the title of the Conference and Convention of 1931, and in the preamble; (*b*) article 1 of the 1936 Convention, which defines the term, for the purposes of that Convention, as meaning "the drugs and substances" to which provisions of the 1912, 1925, and 1931 Conventions "are now or hereafter may be applicable"; (*c*) in legislation of the United States; (*d*) in the title "Commission on Narcotic Drugs"; (*e*) generally as the translation of the French term "stupéfiants," (*f*) generally in discussions as the English term for drugs of the type, frequently shortened to "narcotics."

The term "narcotic drugs" has been used so much to cover the drugs to which the Conventions are primarily applicable, that it has acquired this special meaning. In general language "narcotic" means having certain sense-deadening effects, and such drugs as scopolamine and even the barbiturates may also be called narcotic. *Webster's Dictionary* gives belladonna, as well as opium, as an example of a narcotic drug. The *Shorter Oxford Dictionary* gives for the adjective merely "Having the effect of inducing stupor, sleep, or insensibility," and for the substantive, "Med. A substance which when swallowed, inhaled, or injected into the system induces drowsiness, sleep, stupefaction, or insensibility, according to its strength and the amount taken." Nevertheless, in a suitable context, the special meaning—drugs that are subject to control because of immediate or threatened addiction effects—is usually clear.

Sometimes the term "narcotic" may be considered too restrictive. At its second session the Commission on Narcotic Drugs deleted "narcotic" from the draft of the protocol that was then under examination.[10] The feeling seemed to be that if the general meaning were understood, then sense-deadening effects would have to be proved for any drug that it was desired to put under control, while a special definition might likewise tie the hands of the control authorities. This decision in no way halted the use of "narcotic drugs" and "narcotics" as the usual terms in the discussions of the Commission.

[9] See document C.L.161.1939.XI.

[10] See document E/CN.7/106, page 16.

Perhaps more attention should be given the short form "narcotics" ("narcotic" as a noun). In the proper context, this is understood throughout the English-speaking world as signifying the addiction-forming drugs that require control. "Narkotik" (plural "narkotiki") is also the Russian term. Moreover the term is a combining form (narcotism, narcomania, etc.), and this is true even for other languages. French for example has "narcomanie" in fairly common use although the term "stupéfiants" is preferred for the addiction-forming drugs themselves. There are many advantages in the use of the short, simple term "narcotics."

3. *Habit-forming drugs*

In the effort to be more precise in regard to the nature of the drugs concerned, the term "habit-forming" has often been used in discussions. The term is far too weak, since habits may be formed for all sorts of drugs, some even harmless or nearly so. This has been recognized to the extent that "habit-forming" is often combined with one of the other terms, so that we find references to "dangerous habit-forming drugs" and to "habit-forming narcotic drugs."

4. *Stupéfiants (French); stupefacients (English)*

The French term "stupéfiant" seems to have given more general satisfaction than the English "narcotic drug," or "narcotic" as an adjective. "Stupéfiant" has been defined as a poison which has sedative properties, produces euphoria, and is habit-forming.[11] It has been suggested that the English equivalent would require "dangerous habit-forming narcotic drug."[12]

French-English dictionaries give "stupefacient" and "stupefactive" as English equivalents of "stupéfiant." Peculiarly enough, these English terms have not been used in the Conventions nor even in discussions. They are, in fact, not very common words in comparison to "narcotic." This, however, might even be an advantage: "stupefacient" could be adopted as exactly equivalent to the French "stupéfiant," for the purposes of a Convention, without doing any violence to common speech. Both "stupefacient" and "stupéfiant" can be used as either adjective or noun.

"Estupefacientes" has been the Spanish term used in translations of the Conventions.

"Stupéfiant" (as also "narcotic drug") was rejected at the 1931 Conference as a general term for all the drugs covered, in part because of the difficulty of framing a good definition, but chiefly because it was felt that the term should not be stretched to cover drugs requiring control merely because of convertibility into true "stupéfiants." This difficulty arises with most terms but should not prevent the use of some simple word or phrase for the drugs which make the control necessary and which require a regime of complete control.

A keener objection can be made that "stupefacient" and "stupéfiant" are terms relating to the stupefying action of the drugs, whereas the addicts use them for other reasons, and cocaine, heroin, even morphine do not stupefy those who take them for addiction purposes. All discussion tends to point out that it is the *addiction effects* which make it necessary to control these drugs, and presumably definitions and terms should relate to these addiction effects.

5. *Opiates*

United States law has adopted "opiates" as a general term to cover synthetic drugs brought under the Federal narcotics laws, the test being "addiction-forming or addiction-sustaining liabilities similar to morphine or cocaine."[13] The term has some historical justification, and was also used by the cartel of European manufacturers (1930 and some years thereafter) for their "international agreement on opiates." It possibly has the advantage that it is not likely to be misused carelessly for drugs not acutally under the law. However, it does not seem especially suitable for drugs requiring international control. It emphasizes sleep-inducing and pain-relieving properties by the implied relation to opium, at least as much as addiction-forming properties. Moreover, it seems inappropriate for drugs acting like cocaine or cannabis rather than opium. In such cases even the type of addiction is different. Of course "opiates" is quite suitable as a term comprising opium itself, all the manufactured narcotic drugs obtained from opium, preparations of opium, etc., but not as a general term for the drugs under international control.

6. *Drugs capable of producing toxicomania*

This expression has generally been used in French (*susceptible d'engendrer la toxicomanie*) in place of "capable of producing addiction." In a few cases it has also been used in the English version, *e.g.*, by the Health Committee of the League of Nations in recommending control over benzoylmorphine and other esters of morphine, and dilaudid.[14]

Drugs liable to produce narcomania

This is a more restricted version of the same idea, and seems to merit more consideration than it has had hitherto. "Narcomanie" may also be used in French as a more specific term than the general "toxicomanie." The term is practically the same in Russian also ("narkomaniya"). The chief objection from the point of view of our present examination is that "drugs liable to pro-

[11] Records of the 1931 Conference, vol. II, p. 88.
[12] Historical and Technical Study of 1931 Convention, p. 2.
[13] U. S. Annual Report, 1946.
[14] Document C.L.113.1932.XI., annex O.C.1411 (1).

duce narcomania" is a somewhat cumbersome phrase, more nearly a definition than a simple term of convenience. "Narcomania" is to be understood as a morbid craving for the "narcotic." It has the disadvantage that it has occasionally been used in the sense of a mania produced by a narcotic.

7. *Addiction-forming drugs; drugs of addiction*

The present tendency is to define drugs to be covered in the future as those "capable of producing addiction or of conversion into drugs capable of producing addiction" (see part I, A, 4). "Addiction-forming drugs" may well be used as a shorter form of "drugs capable of producing addiction", probably preferable to "narcotic drugs" or "stupefacients", and certainly more definite than "dangerous drugs". Like the last term, "drugs of addiction" might possibly be taken to include some drugs "capable of conversion into drugs capable of producing addiction", as well as the drugs primarily "capable of producing addiction", if it is necessary to cover "convertible" drugs in the general provisions.

The term "addiction-forming drugs" is the one generally used throughout this document. While not as short as "narcotics" or "stupefacients" its meaning is definite without requiring a special definition, and in particular it focuses attention on the fact that the drugs that have to be controlled are not, basically, those that narcotize or stupefy but those that create addiction. Of course, thebaine and ecgonine are not in themselves addiction-forming and codeine and dionine only feebly so; but such drugs are taken under control because of their relationship to the true addiction-forming drugs.

The social aspect of addiction should be considered dominant in this connexion. The medical definition of "addiction", according to some authorities, requires physical withdrawal symptoms, as a distinction from "habituation", which then is said to imply only psychic craving. For the purposes of this document harmful habit-forming drugs which are socially dangerous and create intense pyschic "addiction" are included in "addiction-forming drugs".

8. *"The drugs" (specified)*

The 1931 Conference abandoned the attempt to choose a more specific term, and simply stated, before enumerating them, "The term 'the drugs' shall denote the following drugs whether partly manufactured or completely refined".

This is generally referred to as a definition, "for the purposes of the Convention"; but properly speaking it is merely the statement of an abbreviation: "the drugs" is simply used as a short form for "the drugs specified in article 1, paragraph 2."

In the 1948 Protocol the term "drugs" is used in its ordinary sense; qualified by other words when necessary; and the reference to "the drugs" of the 1931 Convention in article 1 of the Protocol is given in full as "the drugs specified in article 1, paragraph 2, of the said Convention."

Although the special sense of "the drugs" was a convenience for the 1931 Convention, it was a limitation of a well-known term, and has possibly had the unfortunate result of suggesting that only manufactured substances can be drugs.

There is surely a question whether the convenience of such a short term as "the drugs" overbalances all objections to using it in a special abbreviated sense throughout a convention. (The French text of the 1931 Convention retains quotation marks for "drogues" throughout, as a mark of the restricted sense.) Especially for the new single convention it would seem almost as simple to devote a particular article to the enumeration or definition of the drugs to be covered by a certain regime, and then to refer to "the drugs specified in article . . .", or even, for short, to "the drugs of article . . .", (or "the drugs of annex . . ."). By properly qualifying the term "drugs" whenever it is used, no definition or statement of a special sense is necessary. The word by itself then retains its full meaning and will cover crude drugs such as opium, coca leaves, and cannabis, as well as manufactured drugs.

9. *The "substances" specified*

The term "substances" has been used a number of times in the conventions. Any particular meaning has been given in each instance by qualifying words, without any general restriction to a particular sense, as for "the drugs" in the 1931 Convention. For example, article 4 of the 1925 Convention states, "The provisions of the present chapter apply to the following substances" (which are then listed); articles 5 and 6 do not then refer merely to "the substances" but use the full explanatory phrase, "the substances to which this chapter applies".

There seems to be no advantage in using "substances" in lieu of "drugs", but the word is needed in some cases for substances that may or may not be drugs, as in article 18 of the 1931 Convention, which refers to drugs "converted into non-narcotic substances".

A use which at first appears odd occurs in the 1936 Convention, which after defining "narcotic drugs" to mean "the drugs and substances" to which provision of preceding Conventions "are now or hereafter may be applicable", in its article 10 says that "Any narcotic drugs as well as any substances and instruments intended for the commission of any of the offences referred to in article 2 shall be liable to seizure and confiscation". Here the word "substances" is modified by the phrase "intended for the commission of any of the offences re-

ferred to in article 2", and does not refer to narcotic or prohibited substances (already included in the term "narcotic drugs"), but to such things as laboratory reagents used for illicit manufacture, etc.

It must be noted that if "drugs" is used in a specialized sense without qualifying words, it cannot be used otherwise in the same Convention, and "substances", or some other term, has to be substituted for the general sense.

B. Primary Natural Products ("Raw Materials")

1. *Opium*

(*a*) "Raw Opium" was defined in the 1912 Convention, the definition being the same as that later used except that the words "whatever its content of morphine" were added in 1925. The "Historical and Technical Study" of the 1931 Convention (p. 44) says that these words were inserted in order to prevent raw opium with a natural morphine content of 10 per cent being regarded as medicinal opium. However, the definition of medicinal opium in the 1925 and 1931 Conventions does not include any mention of the percentage of morphine—this occurs in the 1912 Convention, and then only as a minimum (not less than 10 per cent of morphine). The idea seems to have been erroneously based on the international "Agreement respecting unification of Pharmacopoeial Formulas for Potent drugs," signed at Brussels, 29 November 1906,[15] and the later revised Agreement signed at Brussels, 20 August 1929.[16] These provided that Pulvis Opii (powdered opium) should contain 10 per cent of morphine; but many countries are not bound by this provision and in any case it did not mean that there could be no other kind of medicinal opium. In fact, raw opium and medicinal opium can be identical: the *United States Pharmacopoeia,* for example, includes opium which is simply raw opium with a specified minimum content of morphine (9.5 per cent). The words "whatever its content of morphine" therefore fail to make the distinction sought for.

The "manipulations" referred to in the definition of raw opium have been interpreted to include "standardization, conditioning or grading with a view to securing a uniform moisture or morphine content".[17] However, the definition was written in 1925, when there was practically no standardization in the present sense; and one's impression on reading the definition would normally be that manipulations only for packing and transport should not include the mixing, blending, drying, and forming into new cakes, that constitute the present standardization procedures of the national monopolies. Perhaps taking into account manipulations for the purposes of "commerce" would be sufficient, and even include the manipulations for packing and transport. The definition should not suggest that raw opium must have been manipulated. It might therefore read as follows:

"Raw opium" means the spontaneously coagulated juice from the capsules of *Papaver somniferum* L., untreated or subjected only to manipulations necessary for the purposes of commerce.

The possibility of a radical simplification of opium definitions will be considered in part III, B, 1.

(*b*) Medicinal opium. The definition of the 1925 and 1931 Conventions, quoted in part I, A, 1, appears to contain many superfluous words. The following would seem to be sufficient:

"Medicinal opium" is opium that meets the requirements of the national pharmacopoeia.

(*c*) Prepared opium. The 1912 Convention defined "prepared opium" by describing the opium prepared for smoking as known in the Far East. When, at its ninth session (1926) the Advisory Committee on Traffic in Opium and Other Dangerous Drugs of the League of Nations considered the question of the "lula" or "kalam" opium of Iraq, it was recognized that there was a wide gap between the definitions of "raw opium" and "prepared opium", so that, as Mr. van Wettum (Netherlands) put it, "no one could state under what terms of the Convention such opium fell".[18] Apparently the opium in question was similar to the stick opium of Iran, which is (or was until recently) used for consumption by either eating or smoking. This latter is essentially raw opium, but has been submitted to manipulations a little more than "only . . . the necessary manipulations for packing and transport". Although prepared for consumption it in no way comes under the definition of "prepared opium", for it has not been obtained by dissolving, boiling, roasting, or fermentation, nor is it an extract at all.[19]

What is really needed is prohibition of the preparation of opium for smoking, and of the export of any opium for this purpose. The definition of the product should be unnecessary, but it might well be declared contraband, and subject to seizure in all places and circumstances.

"Dross" means the residue remaining when opium has been smoked. There is no point in distinguishing it from "other residues" and including it under "prepared opium" as in the 1912 Convention. In fact, "dross" was used as an independent term in article V of the 1925 Agreement.

[15] *British and Foreign State Papers,* vol. 99, p. 179.
[16] League of Nations, *Treaty Series,* vol. 98, 1930, p. 127.
[17] Historical and Technical Study of the 1931 Convention, p. 44.
[18] Minutes of the Advisory Committee, 9th session, 1926, p. 65.
[19] Minutes of the Advisory Committee, 17th session, 1933, p. 37.

2. *Poppy plant material*

The dried poppy plant material used for manufacturing morphine has been generally called "poppy straw" in questionnaires and discussions, rather than "poppy plant" as in the definition quoted in Part I, B, 2. The term "poppy straw" has been very inclusively defined to take in all parts of the plant used for the extraction of alkaloids, but is frequently misunderstood as applying principally if not exclusively to the stalks of the plant. In actual fact the stalks are excluded as much as possible. The material really used nowadays is the chaff from threshing out the seeds, primarily the capsule chaff, though a little of the upper stem may be included. For the sake of inclusiveness, perhaps the best term for use in the Convention, with reference to the raw material for manufacturing alkaloids, will be "poppy plant material". The only explanation or definition that might be necessary is to refer this term to *Papaver somniferum*. The same is true of the use of the term "poppy capsules" when reference is made to their use as a drug.

3. *Coca leaves*

In regard to this definition, it may be noted that neither "Lamarck" nor "Hieronymus" should be italicized, as is done in the texts of the 1925 and 1931 Conventions respectively. The wording of the definition is somewhat awkward, inasmuch as reference is made to "the *family* of Erythroxylaceae" and then to "this *genus*". Probably the words "belonging to the family of Erythroxylaceae" could just as well be omitted.

4. *Cannabis*

The definition of "Indian hemp" in the 1925 Convention has long been considered less than satisfactory. The League of Nations Subcommittee of the Advisory Committee on Traffic in Opium and other Dangerous Drugs, which studied the problem of "Indian hemp", was called the "Sub-Committee on Cannabis". In O.C/Cannabis/3, Geneva, 12 April 1939, report presented by Dr. J. Bouquet, the definition of "Indian hemp" given by the Convention was discussed in chapter IX, and considered quite unsatisfactory.

The definition apparently was framed with the "ganja" of India in mind, and originally did not precisely cover anything else. In India, large plantations of hemp are grown, from which the staminate plants are carefully weeded out, in the belief that a more copious production of more potent resin is thus obtained. This is the best quality of "ganja", a term which is always limited to the pistillate tops. Some definitions have even been limited to the unfertilized pistillate tops. In fact the definition as first proposed omitted reference to the "fruiting" tops;[20] and during the discussion the statement was made (in accordance with a common belief at that time) that "only the unfertilized female flowers are able to produce the resinous matter, as fertilization destroys the active principle of the plant".[21]

Fortunately the word unfertilized was not included or implied in the definition adopted. The British delegate pointed out that there were administrative difficulties in regard to prosecution if the definition was made too narrow. He also noted that "male and female plants were intermixed in the manufacture of bhang", but endorsed the idea that "the male plant had no effect".[22] The definition finally adopted was based on that of the *British Pharmacopoeia*.[23] The *Pharmacopoeia* of course defined a drug meeting certain standards for medical purposes, and did not necessarily imply that other forms would be inactive.

In fact, the staminate plant, as well as the pistillate, produces physiologically active resin. In most countries, no attempt is made to uproot the staminate plants or prevent the fertilization. The staminate plants die soon after shedding their pollen, so that later in the year any tops gathered are from the pistillate plants. Early in the season, tops may be picked with no attention to whether they are pistillate or staminate—in fact, the plants are virtually indistinguishable before flowering begins. Terms such as bhang, kif, dagga and marihuana are general, and signify the crude hemp drug, not necessarily a particular type of it.

The crude drug most often does consist of the "dried flowering or fruiting tops of the pistillate plant". Such a definition, however, is merely descriptive of the usual product and in no way inclusive. Almost every word is such as to cause administrative difficulties in prosecutions.

No possible benefit can be derived from requiring enforcement officers to prove that a seized drug corresponds to such a definition. Chapter IV, article 11, of the 1925 Convention refers to "Indian hemp and the resin *prepared from it*" (not Cannabis resin as such); and it would be quite impossible to prove that an extracted resin which had been seized in the illicit traffic had necessarily been prepared from "the *dried flowering* or *fruiting tops* of the *pistillate* plant".

The resin could be extracted just as readily from fresh, undried tops by means of a suitable solvent. The tops might be picked before flowering had begun. Indeed, the resin might be extracted from some other part of the plant, though the tops bear most of it. The staminate plants also produce active resin.

The definition finally suggested in O.C./Cannabis/3, report of Dr. Bouquet, Geneva, 12 April 1939, was:

[20] Records of the 1925 Conference, vol. II, p. 297.
[21] Ibid., vol. I, p. 133.
[22] Ibid., vol. II, p. 298.
[23] Ibid., vol. II, p. 318.

"Indian hemp means the plant *Cannabis sativa* L. and its resin, and officinal and non-officinal preparations thereof, excluding the mature decorticated stalks, the textile fibres which they furnish, and likewise the decorticated seeds, and the oil and cakes derived therefrom."

This definition includes the whole plant and then excludes parts and products of it. The term "Indian hemp" besides indicating that the ganja of India was in mind, is somewhat ambiguous. Two or three fibre plants of India, entirely distinct from *Cannabis sativa,* and a North American plant as well, are frequently known as "Indian hemp". Along with its ambiguity the term suggests that the drug-producing hemp is different from ordinary hemp, although the definition is in terms of *Cannabis sativa,* which is ordinary hemp.

The scientific term is "Cannabis". This applies to the drug and also to the plant. The great majority of botanists consider that there is only one species of the genus, *Cannabis sativa* Linnaeus. A few botanists consider that *Cannabis indica* Lamarck, which according to the majority view is only a variety of *Cannabis sativa,* should be considered a separate species. In any case, "Cannabis" designates the plants of this genus, whether one species or two. Other names are sometimes used—*Cannabis americana, Cannabis mexicana,* etc.—but these are certainly mere varieties (*e.g., Cannabis sativa* var. *mexicana*), and have not been claimed by botanists to be separate species.

The following is suggested:

Cannabis sativa shall be the term used for the hemp plant, *Cannabis sativa* Linnaeus, and shall include its variety *indica,* sometimes known as *Cannabis indica* Lamarck. "Cannabis drug" shall be the term used for any addiction-forming drug obtained therefrom.

In discussions, when the distinction between the plant and the drug is made by the context, the simple term "Cannabis" can be used.

The drug may also be defined in terms of the resin:

"Cannabis drug" means any resin-bearing part of the plant *Cannabis sativa* (except that the stalks shall be exempt when used solely for fibre production and not as a drug nor as a source of resin), the resin itself, and any addiction-forming drug derived from the resin.

The language of article 11 of the 1925 Convention in regard to the resin is confusing:

"The Contracting Parties undertake: (*a*) to prohibit the export of the resin obtained from Indian hemp and the ordinary preparations of which the resin forms the base (such as hashish, esrar, chiras, djamba) to countries which have prohibited their use . . ."

[24] O.C./Cannabis/3, p. 98.

Aside from the peculiarity of prohibiting the export only of the "ordinary" preparations, one would at first suppose "preparations of which the resin forms the base" to be those confections, preparations of butter, etc., in which the resin is incorporated; but the examples given—hashish, esrar, chiras, and djamba—are simply the crude resin as separated by mechanical means. (At least they were intended to be, but according to Dr. Bouquet "djamba" is simply the Brazilian term for the crude cannabis drug in its natural state, and there is some question about "esrar".)[24] The word "basis" was originally used instead of "base".

The way the expression would ordinarily be understood is shown by a rewritten version in O.C/Cannabis/7, 22 April 1939, "Present Position in Regard to Cannabis":

"Lastly, the Sub-Committee will no doubt discuss the question of possible measures of supervision in respect of ordinary preparations of which the resin forms the base (various preparations of charas, chira, hashish, esrar, etc.), because, although they are not exported, these multitudinous preparations—sweetmeats, electuaries, etc.—are usually made from smuggled charas, chira, hashish, esrar, etc."

However, this is clearly not the meaning of "preparations of which the resin forms the base" in the Convention. The intention was to prohibit the export of the resin, whether refined or in its usual crude form as exemplified by charas, chira, hashish, etc.

C. Manufactured Drugs

1. Morphine. The fact that morphine was defined as "the principal alkaloid of opium" (together with its chemical formula) does not mean that it would have to be obtained from opium to come within the definition. This is the only logical conclusion, and was moreover a ruling of the Health Section of the League of Nations when this question was raised with reference to application of the 1925 Convention.[25] In any case the 1931 Convention (article 1) provides that "The substances mentioned in this paragraph shall be considered as drugs even if produced by a synthetic process."

2. Diacetylmorphine. To say that " 'diacetylmorphine' means diacetylmorphine", as does the 1925 Convention, is somewhat unnecessary. It arises from the fact that the sentence was originally written as a definition of "heroin". It would be more to the point to recognize in the definition that diacetylmorphine is an ester of morphine; thus: "Diacetylmorphine" (also known as "diamorphine" and "heroin") means the diacetyl ester of morphine having the formula $C_{21}H_{23}O_5N$ (or $C_{17}H_{17}(C_2H_3O)_2O_3N$).

3. Cocaine. There does not appear to be any necessity for stating the specific rotation, when the name in terms

[25] C.H. 851, Geneva, 24 February 1930.

of chemical groups and the elemental formula are both given.

4. Ecgonine. Statement of the specific rotation does not appear to be necessary. It is quite inappropriate to include "derivatives of laevo-ecgonine" under the term "ecgonine" itself, particularly when the term "ecgonine alkaloids" was also used in the 1931 Convention (article 11).

5. Other alkaloids. Definition by formula and definition by other statements could well be combined. For example:

Dihydrocodeinone (of which the substance registered under the name of dicodide is a salt), formula $C_{18}H_{21}O_3N$.

Morphine-N-oxide (registered trade name genomorphine), a pentavalent nitrogen morphine derivative, formula $C_{17}H_{19}O_4N$.

There is a superfluous "o" in the spelling "dihydrohydrooxycodeinone" (English text of the 1931 Convention). It should be simply "dihydrohydroxycodeinone". The French term is "dihydrooxycodéinone".

D. Various Terms

1. *"Raw materials"*

The term "raw material" is properly used with reference to manufacturing; it signifies material available for manufacture into products to be sold by the manufacturer. On account of the importance of the 1931 Convention, which dealt solely with manufacturing, there is a strong tendency to equate the term "raw materials" to the primary natural products (opium, poppy "straw", coca leaves, and "Indian hemp"), not only when these are actually used as raw materials for manufacture, but in all cases. This extended usage can be justified to a certain extent by the fact that "raw" also means "crude", "in the natural state", etc., so that "raw materials" may be taken as equivalent to "crude natural products"; but this is not the accepted idiom.

The term "raw materials" should be used only with respect to actual manufacture, not spread over opium, poppy plant, coca leaves, cannabis drug, etc., when these are not used for manufacture. It is not very satisfactory as a synonym for the primary natural products.

2. *Production*

In its normal English sense "production" includes manufacture. Limitation of the meaning to production of "raw materials", excluding manufactured drugs, may prove unnecessary in a new single convention. In fact, in the 1931 Convention itself, "produced" is sometimes used in regard to manufactured drugs: article 1, 2, "considered as drugs even if produced by a synthetic process"; article 16, (*b*), "the drugs produced".

3. *Manufacture*

This term includes the following terms also used in the Conventions: extraction, conversion, refining, and transformation into salts.

4. *Conversion*

This term denotes a manufacturing process, but a distinction is made from "manufacture" depending on the point of view, the same operation being "conversion" of the drug used up and "manufacture" of the drug made from it. This distinction was introduced as a means of avoiding double accounting.

5. *Extraction*

The definition in the 1936 Convention is made somewhat unclear by the phrase "without involving any actual manufacture or conversion properly so called". Manufacture does include extraction. What seems to be meant is, "without involving any actual synthesis or chemical conversion". "From the substance or compound of which it forms part" is also rather obscure. Both "substance" and "compound" are words having a distinct sense in chemistry, but can hardly be so understood here. From the English text alone, "compound" would appear to have its pharmaceutical meaning in the phrase quoted. What seems to be meant is, "from the material or preparation of which it forms part". However, see 9 below.

6. *Estimates*

The definition depends on the provisions of the Convention, and in fact the definition in the 1931 Convention merely refers to articles 2 to 5.

7. *Stocks*

The definition required depends upon the terms of the Convention.

8. *Derivatives*

In spite of the decision of the Committee of Experts (see part I, D,8), the term "derivative" is often ambiguous. Sometimes it signifies chemical relationship and sometimes it means a product obtained from another regardless of how great the change may be or whether the original material was a simple chemical substance. Phrases like "derivatives of opium" signifying substances obtained (sometimes only indirectly and with modifications) from opium are not scientific but are often used. On account of its ambiguity this term should be avoided, at least wherever its meaning is not perfectly clear.

9. *Compound*

This term is ambiguous. As a noun, it has two quite different meanings, one pharmaceutical and one chemi-

cal; hence on account of ambiguity it is better avoided. This is only too clearly shown by the fact that three different French terms have been used for it in the Conventions, and in two cases the meaning is still uncertain.

In the 1931 Convention the sub-divisions 1 (*a*) and (*b*) and also 2 (*c*) (ii), of article 13, use the term "preparations" ("préparations") in both English and French, but the sub-division 2 (*b*) uses "compounds" in English and "compositions" in French, with the same meaning—pharmaceutical preparations. This seems to have been merely a slip in drafting.[26]

In the 1936 Convention, article 1, 2, "compound" is used in defining "extraction" (see part I, D, 5 for this definition); here also the meaning in the English text seems to be "preparation" (see 5 above). But the French text in this case has "composé", which signifies a compound in the chemical sense. While clear in itself, this makes the definition of "extraction" less clear.

In the preamble of the 1948 Protocol the purpose is stated "to place these drugs, including their preparations and compounds containing these drugs, under control". Here the French text has "mélanges" (mixtures), which indicates that "compounds containing these drugs" virtually repeats the thought of "their preparations".

Thus in all three cases "compound" may have its pharmaceutical meaning, but this is far from certain in two cases. It is probable that in general usage the chemical sense is now much more common.

"Compound" as a verb is understood in its pharmaceutical sense; hence the "compounding of preparations" may be referred to, as in articles 14 and 22 of the 1931 Convention.

10. *Preparation*

The confusion of multitudinous types of preparations is closely related to the question of definitions, but the definition of "preparation" is not the only one involved. In most cases the meaning of this term is fairly clear. With the exceptions noted in the previous discussion (part I, D, 9), the term is used with the meaning "preparation of the pharmaceutical type", if not actually "pharmaceutical preparation" or "preparation for medical purposes". In article 4 (*d*) of the 1925 Convention the most restricted meaning must be the correct one: "preparations" must be "preparations for medical purposes", in order to exclude prepared opium, in spite of the fact that the phrase reads, "all preparations, officinal and non-officinal", without indicating any restrictions.[27] "Prepared" (smoking) opium was not intended to be included here, but logically it ought to come under article 4 (*d*) unless specifically exempted.

The following definition is suggested as the proper meaning to be used consistently:

"Preparation" means a mixture or solution containing a drug, made ready for use.

The word should be used in this sense only, unless it is necessary to establish some other meaning by a different formal definition.

Part III

APPRAISAL OF STATUS AND CONTENT OF DEFINITIONS

A. Drugs (or Substances) Subject to Control

1. *Methods of specifying the drugs concerned*

Three methods may be suggested:

(*a*) Enumeration of the drugs already under the conventions; then use of these (or some of them) as exemplars, other drugs to be controlled in the future to be those "liable to similar abuse and productive of similar ill-effects". This is, generally speaking, what has formerly been done. It must of course be clear that "similar" is not to imply "similar in all respects" but "similar with respect to the problems of addiction". This being the case it would seem better to define in terms of addiction effects in the first place. However, the restrictive phrase will be further considered a little later (see 2 (*a*) following).

(*b*) Enumeration of the drugs already under the conventions, then a definition or statement of the drugs that may be brought under control in the future, in terms of addiction effects. The drugs already under control would serve as examples of the addiction effects, but not in limiting others to "similar" or "the same" effects. The precise purport of the term "addiction" would be left to the experts of the World Health Organization, in accordance with the procedure which would be set out for bringing any drug under control, and of course with the drugs already controlled as examples.

(*c*) The substances to be subject to control might first be referred to in the preamble in a general way, in terms of addiction effects. That is, the intention would be expressed of controlling the dangerous addiction-forming drugs, together with other substances which it is necessary to control in order to prevent the abuse of drugs. This would be a statement of purpose and an indication to the World Health Organization in regard to future

[26] See the *Historical and Technical Study of the 1931 Convention*, p. 176, footnote 1.

[27] The phraseology comes from article 14 of the 1912 Convention.

decisions. The approach in the text of the convention would be pragmatic—the drugs within the scope of the new unified convention would be those already under the control of existing conventions plus those that may be added by the procedure for putting additional drugs under control (with the possibility also of dropping control if it becomes no longer necessary in a particular case). An article of the new convention could provide for an annex containing a list of the drugs already under control, and also provide that this list could be re-issued by the International Control Authority from time to time, with such additions and deletions as may be necessary. This would be preferable to enumerating the drugs at length in the convention. Other articles would establish the procedure for putting additional drugs under control, or freeing any from further control. Here it should not be necessary to *define* the drugs nor their effects, nor such terms as "addiction". It should be sufficient to provide for a decision by experts that it is necessary, desirable, and practicable to put a certain drug, or a certain chemical class of drugs, under control, in accordance with the purpose of the convention (or that it is no longer necessary, desirable, and practicable to keep the drug under control, in case of dropping control in a particular case). Some procedure should be established for the presentation of any possible objections to the particular extension of control under consideration. How a committee of experts should be constituted for such a decision, whether its decision should be binding unless specifically rejected by the Governments, and similar questions, are matters for further consideration. The pragmatic point here is that the *procedure* for putting additional drugs under control would replace the binding definition of what such drugs might be.

2. *Restrictive or defining phrases*

(*a*) *"Liable to similar abuse and productive of similar ill-effects" (1925 Convention)*

The different addiction-forming drugs produce different effects, and in particular cannabis does not produce the same type of addiction as morphine or cocaine. Therefore, when the exemplars do not include any cannabis drug, it is rather doubtful whether the phrase quoted will properly cover new drugs having an effect like cannabis. This situation occurs in the 1948 Protocol, where the language is strengthened to "liable to the same kind of abuse and productive of the same kind of harmful effects as the drugs specified in article 1, paragraph 2" of the 1931 Convention. The drugs there specified do not include any cannabis drug. On the other hand, paragraph 2 of article 1 of the 1948 Protocol apparently does not bind the World Health Organization to this restriction. On the contrary, the World Health Organization need only find that "the drug in question is capable of producing addiction or of conversion into a product capable of producing addiction".

Of course, in "similar ill-effects" or "the same kind of harmful effects", there is no intention to say that the symptoms produced by various drugs are alike. The phrase must be understood in relation to addiction; but there may still be some uncertainty of meaning even when cannabis (or "Indian hemp") is one of the drugs stated as exemplars. The possibility should not be excluded that some new dangerous drug will become known or be created, which needs to be controlled but which can scarcely be said to have the same kind of effects as those now under control, and possibly not even "similar" or "like" ill-effects, unless the term used is rather liberally construed. It would seem to be much better to define the drugs to be covered in terms of addiction effects.

Nevertheless, the formula of "similar ill-effects" does have one advantage. It provides an easy way out of the problem of "convertible" drugs or substances, inasmuch as any such substances to which control may be applied in the future will include, and at the same time be limited to, those presenting dangers similar to the dangers of codeine, thebaine, and ecgonine. It may be doubted if this is a very satisfactory way out of the difficulty, as the problem of "convertible" substances is not defined at all, but rather concealed by attributing abuse and ill-effects to such substances as thebaine and ecgonine. This consideration simply means that in changing to a formula based on addiction effects some provision will have to be made for control over a few closely related substances that are not in themselves directly addiction-forming.

(*b*) *"A drug which is or may be used for medical or scientific purposes" (1948 Protocol)*

This phrase serves one good purpose; namely, it keeps the problem substantially within the ambit of the medical and pharmaceutical professions, and manufacture for medical purposes.

A further reason for its insertion perhaps was that if a dangerous habit-forming narcotic has no other use than for addiction purposes, it should simply be outlawed, whereas the 1931 Convention provides for control and limitation of manufacture.

However, the new single convention may well provide for outlawing dangerous drugs that are useless or nearly so, or that can be replaced by others not so dangerous. This was nearly decided on in the case of heroin in 1931. Moreover, the uselessness of a drug must not prevent a decision being taken in regard to it.

Four possibilities may be considered.

(i) Innumerable variations of synthetics are possible. Among those closely related to amidone, for example, may be some of no medical value but having strong addiction-forming properties. If no barriers are set up,

unscrupulous manufacturers may turn out such products. It may be said that no Government will sanction the production of an obviously dangerous addiction-forming narcotic that has no legitimate use. Doubtless this is true, but medical use or uselessness should not be the only criterion for establishing international control. This should be based also, in fact mainly, on addiction effects. Moreover there are three other possibilities which are more nearly on the borderline.

(ii) The possibility of the production of a medically useless drug or substance which some may consider extremely dangerous while others hold it to be harmless or nearly so. Such a drug might be consumed merely for pleasure and claimed to be completely or virtually harmless. Now that the possibility of control is extended over all sorts of synthetic products, and is no longer limited to "products obtained from any of the phenanthrene alkaloids of opium or from the ecgonine alkaloids of coca leaves", it is scarcely possible any longer to prohibit "trade in or manufacture for trade" merely on the ground of no medical or scientific value, as in article 11 of the 1931 Convention. Dangerous addiction effects will have to be proved, but medical uselessness must not stop the investigation.

(iii) A non-manufactured drug—a vegetable product —might be produced incidentally to some other reason for cultivating the plant, and might be useless medically as a drug, but addiction-producing. This is very nearly the case with cannabis, which may even be declared to be useless medically, as was proposed at the third session of the Commission on Narcotic Drugs.

(iv) A synthetic chemical product might be made for some wholly different purpose, not be offered as a drug at all and be useless and worse than useless medically, but be capable of causing addiction if consumed. Control might offer a difficult problem in such a case, but the possibility of a necessary control should not be excluded.

All such problems have to be settled with regard to the danger of addiction, whether or not the drug has any medical use.

(c) "Any drug (or substance) capable of causing addiction or of conversion into a product capable of causing addiction"

There is a tendency toward the adoption of this or similar language to define the drugs to be covered by the convention. Sometimes "capable of causing or sustaining addiction" is used. The whole phrase, particularly in the "conversion" part, may then be too inclusive. Even "capable of causing addiction" may be thought by some to be too broad. This depends largely upon just what is meant by addiction. It is suggested that this ought to be left to the experts of the World Health Organization, to be considered in direct connection with any particular drug submitted for the decision. However, as an indication to the World Health Organization, the language could be strengthened restrictively, if considered necessary, in either of two ways. Instead of simply "addiction", reference could be made to "dangerous addiction", or instead of "capable of causing addiction", the phrase might be, "liable to cause addiction".

The second part of the definition, regarding conversion, needs more consideration. With the manifold possibilities of synthetics in mind, a conference may well hesitate to extend control to *all* substances (or to *"any* substance") merely "capable of conversion" into an addiction-forming or addiction-sustaining drug. In general, control over an *otherwise harmless* substance, in its licit use, should be asserted only at the moment it is purchased or brought into a factory for conversion into an addiction-forming drug; and even this—in such a case—would be only an accounting control. Special provisions covering illicit manufacture could be inserted in the chapter on illicit traffic.

In the 1931 Conference there was much discussion as to how codeine, in particular, should be brought under control. It was admitted that control over codeine was necessary, but there was no agreement that it causes addiction. Convertibility into dangerous "habit-forming" drugs was made the criterion. Actually, five important factors were involved: (i) codeine is obtained, directly or indirectly, from opium, which itself requires full control; (ii) codeine is mostly made synthetically from morphine, which requires full control and accounting; (iii) codeine even has some addiction-forming properties, although these are admittedly feeble; (iv) codeine has definite addiction-sustaining liabilities; (v) codeine is convertible into addiction-forming drugs. Moreover, all the other "convertible" substances then considered were obtained from opium or coca leaves, so that there was then no real danger of spreading control too far. There is therefore scarcely any precedent here for establishing convertibility alone as justifying international control over every substance "capable of conversion" into an addiction-forming drug. On the other hand, several additional factors, equally with the possibility of conversion, may justify some degree of control. The real question in each case is this: is control *necessary* for a particular substance when it is not addiction-forming itself but related in some way to a dangerous addiction-forming drug?

It is certainly the drugs causing (or liable to cause) dangerous addiction, which primarily need to be controlled. Anything further, such as control over convertible substances, is secondary, and only for the purpose of enforcing the primary control.

This being the case, it should be possible to define the scope of the convention (at least as regards the

preamble) by referring primarily to the dangerous addiction-forming drugs. Other drugs and substances that may require some degree of control should not be "all" addiction-sustaining drugs, "any" substance capable of conversion, etc., but should be those other drugs and substances that it is *necessary* to control in order to enforce control or prohibition of the dangerous addiction-forming drugs.

The statement of the scope of the convention should therefore refer to the dangerous addiction-forming drugs, together with the other substances that it is necessary to control in order to prevent the abuse of drugs.

As regards details, when the problem is wholly within the field of those who produce and dispense the legal narcotics—the pharmaceutical manufacturers and the pharmaceutical and medical professions—it is relatively simple. Even if some innocuous drug should be placed under control it could be handled along with the narcotics and the control would probably not be too onerous. Also the case of an addiction-forming drug converted to some non-narcotic substance (such as coca leaves made into flavouring extract) should not cause too much difficulty. It will probably be agreed that anyone desiring to manufacture from narcotic materials will have to observe controls until the materials are made harmless.

It seems that the difficulties may arise not in regard to where control may end, but where it should begin.

We might adopt the principle that when control has once been applied, it shall continue over substances obtained from that material until it is clearly no longer necessary.

With regard to asserting control, we might accept this principle:

Full control shall be applied only when the fundamental structure of an addiction-forming drug is present or has been created.

In the case of synthetics this would mean that control —beyond a mere accounting of materials—will only apply when the structure of the compound has been built up to the point where chemical experts can say that the fundamental structure of the addiction-forming drug is present. If any further provisions are necessary to close possible leaks and gaps they could be inserted in the chapter on illicit traffic.

B. Primary Natural Products ("Raw Materials")

Some of the definitions in the conventions merely describe the commercial product, without considering whether or not an illicit product would necessarily correspond to the definition. Others are quite broad. The extreme example of the first kind is the definition of "Indian hemp", which only described the pharmacopoeial drug. On the other hand the definition of the coca leaf included not only the two known species yielding the leaves of commerce, but also "the leaf of other species of this genus from which it may be possible to extract cocaine, either directly or by chemical transformation". Considering that definitions must sometimes be used for enforcement purposes, it would seem that in general they should be broad, applicable either to legitimate commercial products or to others. This breadth should be obtained by coming directly to the point, not by attempting exhaustive specifications. On this basis most of the existing definitions are either too limited or too prolix, or both. Revision of the existing text has already been considered; now it is necessary to consider what definitions are really necessary, and to reconsider the text on a fundamental level.

1. *Opium*

(*a*) *What opium definitions are necessary?*

The conventions define raw opium, medicinal opium, and prepared opium. In addition, the questionnaires have distinguished between untreated raw opium and standardized raw opium, and the term "untreated" suggests that there may be other kinds of treated opium, besides standardized, medicinal, and prepared. Too many kinds of opium have been distinguished. Actually what needs to be controlled is simply opium.

Prepared opium was defined in order to delimit its *legal* use. If the principle is now accepted that the use of opium for addiction purposes shall be outlawed, it is only necessary to prohibit the preparation of opium for such purposes, or for any other than medical and scientific purposes. It is not necessary to write a descriptive definition of opium prepared for smoking. In fact any such definition can only leave loopholes, by failing to cover all possibilities of opium prepared in some other way but still used for smoking or some other addiction purpose.

The distinction between raw opium and medicinal opium is artificial. It is perhaps necessary for statistical accounting, but may not have to be embodied in the new single convention. There is nothing in their nature to prevent the same opium being both raw opium and medicinal opium. In fact, the present distinction in the Conventions apparently exists chiefly to clear the way for the legal use of raw opium to make prepared opium for smoking purposes. Thus, by article 5 of the 1925 Convention the Contracting Parties agreed to "enact effective laws or regulations to limit exclusively to medical and scientific purposes the manufacture, import, sale, distribution, export and use of the substances to which this Chapter applies." This provision takes in "medicinal opium" but not "raw opium".

If the principle is accepted that the use of opium shall be confined to medical and scientific purposes, then there is no longer the same necessity to distinguish between raw opium and medicinal opium. Control can be applied simply to opium.

Forms and questionnaires can, of course, continue to make distinctions between untreated raw opium, standardized opium, medicinal opium, etc. However, once the principle of limitation to medical and scientific needs (or purposes) is accepted—if it is accepted—the need for defining all these varieties in the Convention disappears. It is only necessary to define "opium" itself, if any definition at all is needed.

Without defining different kinds of opium, it may be advisable to provide that the only opium that can be exported legitimately, aside from samples for scientific purposes, shall be the opium standardized for commercial purposes by the national monopolies of the exporting countries. Such a provision includes its own definition of "standardized opium" to the full extent necessary.

(*b*) *Simplified and general definition of opium*

If a definition of opium is included at all it should be very simple, *e.g.*, opium is the coagulated juice of the plant *Papaver somniferum* L.

It is entirely unnecessary to insert further descriptive words or phrases, as for example words specifying that the juice is obtained from the capsules, unless a closer description of the commercial product is really needed.

There is, however, the question whether a true opium (containing morphine) might be obtained from any other species of poppy than *Papaver somniferum*. This question was examined in a monograph published by the United States Treasury Department, Bureau of Narcotics: "The Opium Poppy and Other Poppies" (1944). Morphine has never been found in any other plant than *Papaver somniferum*, but many poppies have never been examined chemically. There is a fair probability that one other species produces morphine—namely *Papaver setigerum*, closest relative of *Papaver somniferum*—but actual analyses of it are lacking. There are also hybrids of *Papaver somniferum* with other species, some bearing little external resemblance to *Papaver somniferum*. These have been hybridized for floral purposes, and nothing is known about the inheritance of the morphine-producing characteristics.

To cover all possibilities it would therefore be necessary to define opium in this manner:

Opium is the coagulated juice of morphine-forming poppies.

This perhaps has the further merit of relating the definition for opium to the chemical examination.

On the other hand, it may be better to limit the definition to the present situation, in which case any new kind of "opium" can still be brought under control, under some other name and definition, in case it ever requires control. This will certainly be the best procedure so far as concerns the possibility of ever obtaining commercially any "phenanthrene alkaloid of opium", other than morphine, from some species of plant other than *Papaver somniferum*. Probably it is true even for the chance that some other poppy may sometime be found to have a morphine-containing juice. There is a certain advantage in including morphine in the definition, and the question can be considered. However, opium, no less than morphine, is a definite, well-known substance. If a definition of it is required at all, it is only for the purpose of being quite specific. A definition including more than the normal meaning might arouse some doubt as to exactly what "opium" might mean, just contrary to the ostensible purpose of giving a definition. It is probably best, therefore, that opium be defined with reference only to *Papaver somniferum*.

2. *Poppy plant material or poppy capsules*

The discussion above in regard to the source of opium applies also to poppy plant material. It is possible that some other species of poppies contain morphine, but in the existing situation reference need be made only to *Papaver somniferum*.

It is recommended that use of the term "opium poppy" be avoided. The reason is the possible ambiguity between "poppy capable of producing opium" and "poppy grown for the production of opium". The absence of cultivation of the "opium poppy" is sometimes reported when in fact *Papaver somniferum* is cultivated, but only for its edible and oil-bearing seeds.

There may be a question whether dried poppy capsules for drug purposes come under the existing conventions. Considering the slight difference between "medicinal opium" as a manufactured drug (1925 Convention) and raw opium, it may be argued that poppy capsules come, or ought to come, under the "preparations containing more than 0.2 per cent of morphine" of chapter III of the 1925 Convention, whenever they have more than this content and are "prepared" for drug use. In fact, that dried poppy capsules should be regarded as coming under the 1925 and 1931 Conventions was apparently the view taken in the Advisory Committee on Traffic in Opium and Other Dangerous Drugs of the League of Nations, in 1934.[28] However, this will hardly fit the usual meaning of "preparation", and in any case the matter needs clarification when a new Convention is drafted. Formerly the poppy capsules were

[28] Minutes of the Advisory Committee, 19th session, 1934, p. 50. (Document C.33.M.14.1935.XI)

believed to contain only very minute amounts of morphine, but since the inauguration of the "Kabay process"[29] numerous analyses and manufacturing results have shown that the dry capsules generally contain more than 0.2 per cent morphine, even up to 1 per cent or so. Undoubtedly they should be brought under control when used as a drug or for the manufacture of drugs, but if possible by provisions that do not interfere with poppy-seed production.

A broad definition of poppy capsules for drug purposes, or of "poppy plant material" subject to control, may necessitate the statement that the growing plant, when cultivated exclusively for other than drug purposes, is not included in the definition, and may be controlled or not at the discretion of the Government concerned.

3. *Coca leaves*

"Coca leaf" (the singular form is used in the conventions) is not such a definite, easily recognizable substance as opium. The existing definition names two species and also includes "the leaf of other species of this genus from which it may be found possible to extract cocaine, either directly or by chemical transformation". There has been some argument about the botanical species involved in producing the coca leaves of commerce, so it was probably for this reason that the general phrase was added. It is not absolutely certain that the two named species take in all the leaves now used for manufacturing and for chewing, although this is the opinion of the best authorities. It may therefore be best to continue to use this same sort of definition. The following is suggested:

Coca leaves are the leaves of *Erythroxylum* species, which contain or yield cocaine either directly or by conversion of ecgonine; the species now used commercially are recognized as *Erythroxylum coca* Lamarck and *Erythroxylum novogranatense* (Morris) Hieronymus.

As a matter of fact, the commercial meaning of coca leaves is not based on the botanical identification, but on the fact that they yield cocaine, either directly or by hydrolysis of the alkaloids to ecgonine and its conversion to cocaine. The leaves are a well-known material of commerce and probably no definition is really necessary. A definition is not necessary if it is understood that the practical test for identifying leaves as coca leaves is the fact of their containing or yielding cocaine.

4. *Cannabis*

The question of the text of a definition has already been discussed at length (part II, B, 4). The question may be raised whether any definition is necessary when the scientific term "cannabis" is used. *Cannabis sativa* is a well-known botanical species and "cannabis drug" is self-explanatory; but experience has shown that the term "Indian hemp", even though defined, is confusing.

The hemp plant, *Cannabis sativa,* is grown far more widely for its fibres, and even for its oil-bearing seeds, than for the narcotic resin. It is so important industrially that, even more than in the case of the poppy plant, if an extremely broad definition is adopted for the material to be controlled, it may be necessary to add that the growing plant, when cultivated exclusively for other than drug purposes, is not included in the definition, and its control is a matter for the discretion of each Government individually.

C. Manufactured Drugs

1. *Definitions of the manufactured drugs*

The definitions of the manufactured drugs in the 1931 Convention should not be regarded as fully defining them, even though the elemental chemical formulas are given. The elemental formulas alone are quite inadequate to full definition. This is illustrated by the fact that dihydrocodeinone and codeine have exactly the same formula, $C_{18}H_{21}O_3N$. In fact numerous entirely different compounds might be found having exactly the same elemental formulas as some of the drugs defined in this way in article 1, paragraph 3, of the 1931 Convention.

As has been previously pointed out (part I, C, 5) additional information was in fact given in the Convention. Even then the information is rather scanty to be regarded as full definition. The question may be asked whether it has been adequate to its purpose.

The information has been adequate to the purposes of the Convention because in the main no real definitions were required, merely an enumeration of the drugs to be covered. There is no doubt or dispute about the meaning of "morphine", "codeine", "thebaine", and most of the others, as chemical substances. They really only need a little explanation, in regard to commercial terms or otherwise, but this seldom amounts to a real definition. What is needed is merely a list or enumeration of the drugs covered rather than a set of definitions properly speaking. Such a list should include the minimum of information necessary to be quite specific, but it is not necessary to consider whether each drug is completely and uniquely defined, as long as it is perfectly clear what substance is meant. The elemental formulas can be combined with other information in the manner shown in part II, C, 5.

The synthetic equivalents of natural alkaloids will, of course, be included.

[29] Commercial extraction of morphine from poppy plant material was first developed by a Hungarian scientist, Janos de Kabay. An account including the patent specification, was published soon after the commercial success was established, in League of Nations document C.256.M.105.1934.XI, report to the Council on the work of the 18th session of the Opium Advisory Committee, annex 3.

2. *The term "manufactured drugs"*

The existing Conventions make a basic distinction between manufactured drugs and "raw materials".

There is a genuine difference between primary natural products and manufactured drugs, and the division has been kept for convenience in discussing the definitions. However, essentially the same control should apply to all kinds of socially dangerous addiction-forming drugs, whether they are natural products hitherto regarded chiefly as "raw materials", manufactured drugs derived from natural products, or synthetics.

D. Various Terms

If the principle is accepted, that production of the dangerous addiction-forming substances for drug use should be limited to medical and scientific purposes, many of the difficulties with definitions vanish at once. Definitions of different kinds of opium will not be necessary, since it is simply "opium" that needs to be limited. The term "raw materials" will not be needed for a particular class of narcotics distinguished from manufactured drugs. If used at all, the term will simply indicate the materials that the factories take in. The term "production" will include "manufacture". "Manufacture", if used at all, will not require so much splitting up into extraction, conversion, refining, and transformation. Some other difficulties will similarly almost solve themselves, if we do not needlessly repeat involved definitions of the past, but consider only what is necessary under the general principles that should be established by the new convention.

1. *"Raw materials"*

Unnecessary as a synonym for the crude natural products, and misleading when used in that sense, this term should be used only with direct reference to manufacture. Even then, its present use is unfortunate in separating some narcotics as mere "raw materials" from the others which are manufactured drugs. Opium should be treated as a narcotic drug, not as a mere "raw material". A unitary convention should concern itself equally with all addiction-forming drugs, without making an artificial distinction, as at present, between manufactured narcotics and "raw materials" which are also narcotic drugs.

2. *Production*

In considering limitation of production it is necessary to note that the formula of "production only for medical and scientific needs" may be unduly restrictive. For example, in the case of coca leaves, even if chewing should be determined to be quite harmful and ruled out (in principle at least) as constituting dangerous addiction, we shall still have to retain production of the leaves for flavouring extract as well as for medical and scientific purposes. In the case of new synthetics it is quite conceivable that an addiction-forming drug may also have chemical or industrial uses that are not, strictly speaking, either medical or scientific. If it is made entirely plain that production for addiction uses is illegitimate, then the word "legitimate", used in the 1912 Convention (article 9) might perhaps be restored to use. As an alternative, the formula can perhaps be amended as follows:

"Production for drug use of any substance under the control of the convention shall be only for medical and scientific purposes."

"Production" of raw opium, as interpreted in practice, has had two different meanings. Some countries and some representatives to the Commission on Narcotic Drugs understand the opium production of a country to be its whole production of opium, licit or illicit, whether produced under control or not, and whether remaining under control, or brought under control, or not. But a number of other countries—the majority, in fact, of the producing countries—interpret opium production, at least statistically, as meaning only the opium purchased, or collected under full control of the governmental monopoly, or otherwise officially recognized as "produced". Any other production, even when legal, or in other cases tolerated, is not considered. Likewise, the possibility of diversion is left unconsidered—the possibility that the peasant cultivators will not turn over all the opium they collect to the governmental monopoly but will sell some of it to illicit traffickers and smugglers.

It must be admitted that it will often be difficult for a country to estimate its total production with any great accuracy, especially if there is some cultivation that is wholly illicit. Still, it seems that the term production ought to mean this. Purchases or collections from the peasants by the agents of the governmental monopoly ought to be called purchases or collections of opium produced, and not be called "production". It would be well if the Annual Reports could include estimates by the agricultural authorities of the possible total production of raw opium. For the purposes of statistical control the quantities brought under strict governmental control would, of course, be reported. It may be that some countries would be reluctant to disclose estimates of total production, but the approach would be more realistic than at present.

Production of a primary natural narcotic or raw material should mean the total actually produced, whether legal production and under control or not; but it should not include a merely potential production from the plants cultivated for other purposes or growing wild—such as poppy plant material not collected for extraction or drug use, coca leaves never gathered, or cannabis drug not harvested from the hemp plants.

3. *Manufacture*

If a new convention is not limited to manufacture of drugs but concerns the production—in the broadest sense—of addiction-forming drugs by any means, then there is comparatively little use for this term, and that only in its obvious meaning.

4. *Conversion*

Probably no definition is necessary. The use of the word has been, after all, in an obvious sense. Conversion is simply an aspect of manufacture, as manufacture is an aspect of production. Something may be said, however, in regard to the possibility of so defining "convertible" as to preserve the idea of including under control all substances "convertible" into addiction-forming drugs (discussed above, part III, A, 2, (*c*)).

In cases of conversion of morphine, or some other phenanthrene alkaloid of opium, the greater part of the molecule remains unaffected. For example, in the conversion of morphine into codeine, the morphine molecule of molecular weight 285 loses only a weight of 1 and then gains a weight of 15, a great block of the molecule, of molecular weight 284, remaining unaffected. This is quantitatively different from the "conversion" of substances such as propylene oxide, dimethylamine, and benzaldehyde into amidone. In this latter case, each of the other three substances contributes only a particular part of the amidone molecule, and the addiction-forming properties cannot be said to be inherent in any one of them but only in the complex that is built up. There might seem to be the ground of distinction here. Actually we have already had something of the kind in the case of cocaine. Here the ecgonine part instead of constituting nearly the whole of the cocaine molecule forms only about two-thirds of it (molecular weight 203 as compared with 303 for cocaine). Moreover the ecgonine itself is non-habit-forming, so that the methyl and benzoyl parts of the molecule—or some equivalent radicals—are equally necessary to the formation of an addiction-forming drug. Conventionally we think of the ecgonine as convertible into cocaine but actually it is methyl alcohol, benzoic acid, and ecgonine, the three together, that are convertible into cocaine. Ecgonine is obtained from coca leaves and in fact from cocaine and similar alkaloids already existent in the leaves, besides constituting two-thirds of the cocaine molecule, so there are compelling reasons for controlling it. However, it is difficult to draw a dividing line based on the single criterion of mere "convertibility". The conclusion, as in the preceding discussion (part III, A, 2, (*c*)) is that, in the case of synthetics, control should not be asserted until at least the main fundamental structure of an addiction-forming drug has been created; but thereafter control should be continued until the drug has been legitimately consumed or its structure rendered completely harmless by further processes.

5. *Extraction*

Since the word has been used in an obvious sense, even though the existing definition is far from perfect, there does not seem to be an established need for any definition at all.

6. *Estimates*

The simplest and perhaps an effective way of limiting the production of raw opium, poppy chaff for alkaloids, etc., to medical and scientific needs would seem to be to include these substances in the estimate system.

7. *Derivative*

If this term is avoided except where its meaning is perfectly clear (as suggested, part II, D, 8), its definition can hardly be necessary. It should be used only in a restricted scientific meaning, as in the 1931 Convention (quoted in part I, D, 8). The meaning of the *word* may be clear enough in the case of "all derivatives of opium", and similar phrases, but the nature of the substances included under such a designation is not clear; consequently such uses of the term should be avoided.

8. *Compound*

Even in the existing conventions it is difficult to be entirely sure whether the chemical or the pharmaceutical meaning is intended. Instead of defining the word, it will be better not to use it as an unmodified noun. In the pharmaceutical sense "preparation" will serve better. If the chemical meaning of the noun should be needed, it will be best to say "chemical compound".

9. *Preparation*

The 1931 Convention defined some preparations as "drugs" while using the term in most cases for preparations made from "the drugs". This alone is responsible for creating at least four separate classes of preparations made "directly" from opium and coca leaves—two defined as "drugs" and two excluded from the 1931 Convention—and separating them from the various kinds of preparations made from "the drugs", of which there were also several different kinds. There is no reason why under the new single convention there should be more than two kinds of preparations—those subject to further control, and those exempt from further control when once made.

The division of "the drugs" of the 1931 Convention into groups I and II was responsible for the creation of certain different classes of preparations. As a matter of fact, the regime for drugs of group I in a great many respects is the same as for drugs of group II, so far as the drugs themselves are concerned. The principal exceptions are that statistics of consumption do not have to be reported for drugs of group II, and that trade

statistics are furnished annually and not quarterly as in the case of drugs in group I. Otherwise, the chief difference is in the treatment of their preparations: preparations of group I drugs are normally subject to further control while those of group II drugs are not. It might therefore be possible to abandon the division of the drugs under control into groups I and II, and merely divide the preparations into the exempt and the non-exempt.

Exemptions may probably be of two kinds:

(1) Exemption for preparations made up by retail pharmacists in response to doctors' prescriptions;

(2) Exemption for certain kinds of preparations considered to be safe from addiction-abuse. The compounding of such preparations, under control, can be permitted to wholesale drug-manufacturers, and such preparations then be released from further control.

In the most general control provisions, preparations may be treated either as included in the term "drugs", or as being made from the drugs already accounted for in the limitation plan. The former appears to be the usage in the 1948 Protocol; the latter, with a number of exceptions, was the general idea in the Limitation Convention (1931 Convention). These two plans are not necessarily as far apart as they may seem. They may be presented as follows:

Alternative (A)

The "drugs" or "substances" of the convention shall in principle include their preparations.

(1) The list of substances under control will include as a final item "All preparations of these substances except those specifically exempted".

(2) In general clauses it will only be necessary to refer to "the substances under control" or "the substances of article . . .". This will be understood to include preparations.

(3) "Preparations" will be mentioned for the specific exemptions.

Alternative (B)

The term "drugs" or "substances" of the convention shall not include their preparations.

(1) The list of substances under control will not include any preparations.

(2) In general control clauses it will be necessary to refer to "the substances under control and their non-exempt preparations", or "the substances of article . . . and their non-exempt preparations", or the like.

(3) A system of dividing preparations into the exempt and the non-exempt will be required.

In either case further provisions may be necessary. The important thing is to carry out one plan or the other consistently. This is chiefly a matter of proper drafting.

Part IV

PROPOSALS

A. Substances to be Controlled

In defining the drugs to be controlled, the following points are suggested:

1. The purpose is to control (and if necessary, prohibit) drugs liable to cause socially dangerous addiction, or narcomania (see part III, A, 2, (*c*); and part II, A, 6 and 7). These drugs may be called, for short, "addiction-forming drugs", or "narcotics", or "stupefacients" (see part II, A).

2. Control must encompass some substances not in themselves addiction-forming; such substances should be placed under control only as this is necessary to enforce control of the addiction-forming drugs. The general formula of controlling "*any* substance *capable* of conversion into a drug capable of causing addiction" should be abandoned. This formula is too broad in one way, too narrow in another, since there are other factors to be considered besides convertibility (see especially part III, A, 2, (*c*)).

3. The unified convention will be greatly simplified if the text does not have to be burdened with the detailed enumeration and definitions of all the drugs to be covered. The following provisions are suggested: (1) a general statement concerning the substances to be controlled, *e.g.*, that they shall be addiction-forming drugs, including, if it is necessary to specify this, those habit-forming drugs liable to create intense craving or psychic addiction, the abuse of which is harmful and socially dangerous; (2) an article taking under control all the drugs at the time under the present conventions, providing for a list of these drugs in an annex, and also providing that this list may be reissued from time to time by the International Control Authority, with any necessary additions or deletions; (3) an article, or articles, stating the procedure for extending control (see part III, A, 1).

4. Definition of drugs to be covered should be related to addiction liabilities. The formula "liable to similar abuse and productive of similar ill-effects" requires exemplars and is open to the objection that the addiction-effects of new drugs may not be truly "similar" to those of old ones (much less "the same kind" as in the 1948 Protocol). Restriction to "a drug which is or may be used for medical or scientific purposes" should not be used in the unified convention because the useless-

ness of a drug should not operate against international control and there are various borderline possibilities. The danger of addiction as a social menace should be the primary consideration leading to control (see part III, A, 2 (*a*) and (*b*)). The production of "addiction-forming drugs" which are medically and otherwise useless should be prohibited.

5. The procedure for extending control should be regarded as the essential part of the definition of additional substances that may be brought under the convention. It should be carefully safeguarded to allay any apprehension that control might be spread too far. Particularly in the case of substances not addiction-forming in themselves, provision should be made for considering any objections to the control before it is established (see part III, A, 1, (*c*).

6. Control (beyond merely accounting for materials) should be asserted only when the fundamental structure of a recognized addiction-forming drug is present. However, special provisions to broaden this base can be included in the chapter on illicit traffic, if necessary. Control once established should continue until the substance concerned is consumed legitimately as a narcotic, or otherwise rendered harmless and accounted for (see part III, A, 2 (*c*) and part III, D, 4).

B. Primary Natural Products

1. *Opium*

If the principle is accepted that production of opium be limited to medical and scientific purposes and its use for other purposes be outlawed, there is no need for a definition of "prepared opium", and little if any necessity for attempting a distinction between "raw opium" and "medicinal opium". "Prepared opium" can be outlawed by exclusion—or, if necessary, by specifically stating that opium prepared for smoking shall be prohibited —but not by attempting to frame a definition for it.

The substance that needs to be controlled is opium. This substance is perfectly well known and there is no dispute about its identity, therefore probably no definition is needed for the convention. If a definition of opium is used it should be very simple, *e.g.*, opium is the coagulated juice of the plant *Papaver somniferum* L.

(See chiefly part III, B, 1. For definitions of "raw opium" and "medicinal opium", if needed, see part II, B, 1.)

2. *Poppy plant material*

The terms "poppy plant material" and "poppy capsules" are recommended. These need only the explanation that "poppy" refers to *Papaver somniferum*. It is recommended that the terms "poppy straw" and "opium poppy" be avoided, the former because it is misunderstood as referring to the stems, and the latter because of ambiguity between "poppy capable of producing opium" and "poppy grown for the production of opium" (see part II, B, 2, and part III, B, 2).

3. *Coca leaves*

The following definition is suggested: coca leaves are the leaves of *Erythroxylum* species, which contain or yield cocaine either directly or by conversion of ecgonine; the species now used commercially are recognized as *Erythroxylum coca* Lamarck and *Erythroxylum novogranatense* (Morris) Hieronymus.

Probably no definition is really necessary as it is quite well understood what is meant by coca leaves, and that in case of any doubt, the fact of containing or yielding cocaine is the practical test (see part III, B, 3).

4. *Cannabis*

The following is proposed:

Cannabis sativa shall be the term used for the hemp plant, *Cannabis sativa* Linnaeus, and shall include its variety *indica* sometimes known as *Cannabis indica* Lamarck. "Cannabis drug" shall be the term used for any addiction-forming drug obtained therefrom. (A definition in terms of the resin is also given in part II, B, 4.)

A definition is really not necessary, as *Cannabis sativa* is a scientific botanical term and "cannabis drug" is self-explanatory (see part III, B, 4).

5. *Reservation*

So far as cultivation is concerned it should be remembered that the plants may be cultivated for other than drug purposes, particularly *Papaver somniferum* and *Cannabis sativa*. If extremely broad definitions are adopted for the materials to be controlled, it may be necessary to add that the growing plants when cultivated exclusively for other than drug purposes, are not included in the definition, and may be controlled or not at the discretion of the Government concerned (see part III, B, 2 and 4).

C. Manufactured Drugs

There is no real doubt or dispute about the identity of "morphine", "codeine", "thebaine", etc. All that is needed is an enumeration of the drugs to be controlled, with a minimum of definition (see part IV, A, 3; part III, A, 1, (*c*); part III, C, 1, and part II, C).

Essentially the same kind of control should apply to all kinds of socially dangerous addiction-forming drugs,

whether they are manufactured drugs or the harvested natural products hitherto regarded chiefly as "raw materials" (see part III, C, 2).

D. Various Terms

1. *"Raw materials"*

Properly the term signifies materials taken into factories for processing or the manufacture of products. There is a tendency to equate the term to the primary natural products, not only when these are used as raw materials for manufacture, but in all cases. It will be better to use the term only in its idiomatic sense, with reference to manufacturing. In its normal meaning, it does not need a formal definition. It should not be used to imply a distinction between manufactured drugs and narcotic "raw materials" in regard to their treatment as narcotics (see part II, D, 1, and part III, D, 1).

2. *Production*

The term has been limited, in some cases, to production of "raw materials" as distinguished from the manufacture of drugs. In its normal English sense "production" includes manufacture. The unitary convention should place all production of narcotics, whether crude natural drugs or manufactured drugs, on the same level, in principle (see part II, D, 2, and Part III, D, 2). In order that the purpose of the convention may be accomplished, the meaning of *production* of the primary natural products should include all actual production and not merely the legal or the purchased production (see part II, D, 2).

3. *Manufacture*

If a new convention is not limited to the manufacturing, but concerns the production (in the broadest sense) of "addiction-forming drugs" by any means, then there is little use, if any, for this term. In any case it should not require a formal definition (see part II, D, 3, and part III, D, 3).

4. *Conversion*

It may be questioned whether the term is necessary for the new unified convention, as conversion is included in manufacture. In any case a formal definition scarcely seems necessary, as the meaning is normal. It could still be used statistically to avoid double accounting (see part II, D, 4, and part III, D, 4).

5. *Extraction*

The definition given in the 1936 Convention is subject to criticism, but the word has been used in an obvious sense. There does not seem to be an established need for a formal definition (see part II, D, 5, and part III, D, 5).

6. *Estimates*

The natural products should be included in the estimates. The definition (whether given formally or not) depends on the provisions of the convention (see part II, D, 6, and part III, D, 6).

7. *Stocks*

For such kinds of stocks as may be authorized the meaning depends on the provisions of the convention (see part II, D, 7).

8. *Derivative*

This term is likely to be ambiguous and on this account should be avoided. It should be used, if at all, only in the scientific sense where the meaning is obvious (see part II, D, 8, and part III, D, 7).

9. *Compound*

This term is too ambiguous as an unmodified noun. "Preparation" can replace it in the pharmaceutical sense; "chemical compound" in the chemical sense (see part I, D, 9, part II, D, 9, and part III, D, 8).

10. *Preparation*

The term should be restricted to its ordinary pharmaceutical sense, not including such "preparations" as pantopon and charas. A multiplicity of preparations are distinguished now; there should be no need for more than two: those subject to further control and those exempt from further control when once made. The question should be considered whether to include "preparations" within the scope of term "drugs" or "substances" under control (except when specifically exempted), or to consider them only as containing drugs. However, this last point is chiefly a matter of drafting, not affecting the basic considerations (see part I, D, 10, part II, D, 10, and part III, D, 9).

NOTE OF THE JOINT SECRETARIAT OF THE PERMANENT CENTRAL OPIUM BOARD AND THE DRUG SUPERVISORY BODY

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N.B.—Throughout this document, the term "Board" denotes the Permanent Central Board created under article 19 of the 1925 Convention; the term "Supervisory Body" denotes the organ created under article 5(6) of the 1931 Convention; the term "International Control Board", or "ICB", denotes the organ which might replace both the above-mentioned under the contemplated single convention.

I. INTRODUCTION

The present document is part of a series of memoranda written with the object of preparing a unified convention on narcotic drugs. It was prepared by the joint secretariat of the Permanent Central Board and Supervisory Body on their own responsibility. It in no way reflects the views of the Board or Supervisory Body or of any member of those organs, whose opinions must be entirely reserved.

The comments made in this note on the actual working of the 1925 and 1931 Conventions, the interpretation of Governments, the failure of the latter to comply with the obligations, as indeed, any other comments, have been based on the practical experience, of the working of the conventions, of the staff, going back over nearly two decades. There exist concrete examples in support of all statements of fact; but to have mentioned them all would have unduly burdened this note.

II. DEFINITIONS

A. Scope

1. Both the 1925 and 1931 Conventions give scientific descriptions of substances, and we have no comment on these descriptions.

2. Article 1 of the 1931 Convention, however, divides narcotics into certain categories and defines certain terms. On this, we submit the following remarks:

(*a*) *Crude drugs.* There seems to be some inconsistency between the first sentence of paragraph 2, which reads "the terms 'the drugs' shall denote the following drugs, whether partly manufactured or completely refined", and the first sentence of paragraph 4, which reads "The term 'manufacture' shall include any process of refining". Under the first of these texts, crude cocaine, for example, is to be counted as cocaine; but, under the second text, its refining into pure cocaine is to be counted as *manufacture* of cocaine. This inconsistency has given rise to endless difficulties.

Suggestion. Crude drugs should be differentiated from pure drugs and should be the object of distinct estimates and statistics.

(*b*) *Sub-groups (a) and (b) of group I.* This sub-grouping uselessly burdens the Convention. In fact, there is no difference between the control applied to one sub-group and the control applied to the other sub-group. Moreover, the scientific basis of the sub-grouping is questionable: according to the text of the first sentence of paragraph 2, crude cocaine belongs to sub-group (*a*), whereas ecgonine, which is an intermediary product between crude and pure cocaine, belongs to sub-group (*b*).

Suggestion. Suppress this sub-grouping—as already done in the Protocol of 19 November 1948.

B. Wording

1. *Names of drugs*

At the suggestion of Mr. Atzenwiler, the Assistant Secretary of the Permanent Central Opium Board, the WHO Committee of Experts on Habit-Forming Drugs, at its January 1949 session, adopted a recommendation that any narcotic drug having a long chemical name and several trade names should be given *one* name, internationally accepted, for the purpose of international control and international transactions (without prejudice, of course, to whatever trade names it may have). One such drug, for example, is acetyldemethylodihydrothebaine or acetyldihydrocodeinone, the hydrochloride of which has the trade name of "acedicone"; "demerol" is another; it has about ten trade names, its chemical designation is long and can be formulated in several ways. It takes the day-to-day work of tabulating statistics furnished by Governments to realize how easily national authorities confuse morphine, methylmorphine and ethylmorphine; codeine and drugs with names containing the syllables "codeinone". Many governments do not realize that "demerol", "dolantin", "dolosal" and "pethidine" are all the same drug. We believe that, unless the above-mentioned recommendation is carried out, international control will be greatly hampered by difficulties in identifying drugs. We therefore welcome the fact that, at its third session, the Executive Board of the WHO asked its Committee of Experts on the Unification of Pharmacopoeias to consider this matter.

Suggestion. Machinery to give international names to the drugs concerned should be embodied in the contemplated unified convention.

2. *Manufacture*

See paragraph 2 (*a*) above.

3. *Conversion*

Suggestion. ". . . of a drug, *into another drug or another substance,* by a chemical process, *but not the conversion of alkaloids into their salts*".

4. *Estimates*

The term is not altogether satisfactory since it has connotations other than that of forecasting. Thus, for instance, in the technique of statistics it can mean, on the one hand, a forecast or, on the other, a calculation made in the absence of an official or proved figure. This double meaning makes it awkward sometimes to use this term in the headings of the Board's statistical tables next to actual statistics. There does not appear to exist, however, any other suitable term in English. The same double meaning and the same difficulties attend the word of *évaluations* in French. Here, however, a correct alternative exists, i.e., *prévisions.*

Suggestion. Prévisions would seem to be a better definition of the information in question, at least in French.

5. *Reserve stocks*

The word "reserve" was doubtless introduced to distinguish ordinary stocks from government stocks. This word, however, is sometimes taken to mean some special kind of stock, or sometimes the minimum quantity which should always be on hand regardless of day-to-day fluctuations (all the more when used together with the words "it is desired to maintain" (see chapter III on "Estimates", section C, paragraph 3 (*d*)).

Suggestion. Delete the word "reserve"; it would no longer be necessary, anyway, if the suggestions made below with respect to the term "government stock" were adopted.

6. *Government stock*

Under the scheme for limiting the manufacture and regulating the distribution of drugs, set up by the 1931 Convention, and, indeed, under any other scheme, State requirements should be known. Government stocks are only part of these requirements and do not include the amounts imported and/or manufactured and utilized in the same year. These amounts may indirectly affect the stock; but this is not immediately evident. On the other hand, it is immediately evident that the term "State requirements" would include at once the quantities to be procured both for use in the current year and for maintaining or replenishing government stocks. And, if Governments drew from their "stock" the amounts required for State use in the current year, rather than manufacturing or importing them, the yearly amount of the quantities to be procured through manufacture or import would be reduced accordingly.

Suggested definition. "The term 'State' requirements' in relation to any of the drugs shall denote the amounts required for use by the armed forces and the amounts needed by the Government to meet exceptional circumstances." (Articles 4, 5 and 6 should be amended accordingly.)

III. ESTIMATES

A. Preliminary Remarks

1. In order to differentiate between the two kinds of estimates asked for under the 1925 Convention and the 1931 Convention, respectively, the Board headed the form relating to the first "Estimates of 'Raw Materials'" and that relating to the second "Estimates of Drugs". The former term is not accurate, for the form also applies to preparations which are ready for consumption without further treatment; it was only chosen to avoid such accurate but lengthy description as: "Estimates of substances only covered by the Convention of 19 February 1925".

2. In 1934, upon the coming into force of the 1931 Convention which introduced binding estimates for "drugs", the Board considered whether it should not abandon asking for estimates under the 1925 Convention. It appeared undesirable to ask both binding and non-binding estimates for the same substances. To avoid duplication and discrepancies, the Board agreed that countries which had furnished estimates of their requirements in manufactured drugs under the 1931 Convention would not have to furnish any further estimates for such drugs. It was thought, however, that countries which were Parties to the 1925, but not to the 1931, Convention might prefer to continue furnishing estimates under the former Convention. Thus the Board stated:

"In cases where no such estimates (i.e., estimates under the 1931 Convention) have been sent, countries Parties to the Geneva Convention of 19 February 1925, will fulfill the obligations arising from article 21 of that Convention".

In practice this proviso proved valueless and was later abandoned.

3. The further problem whether estimates under the 1925 Convention should be given up altogether was complicated by the fact that this Convention covers certain substances (opium, coca leaves, Indian hemp, and some of their preparations) which do not fall under the 1931 Convention. In these circumstances, the Board considered that, while making no use whatsoever of these estimates, it had no right to relieve Governments of the obligations to supply them.

B. Estimates of "Raw Materials"

1. *Descriptive*

As stated above, this term refers to the estimates required under article 21 of the 1925 Convention, which reads as follows:

"The Contracting Parties agree to send in annually before 31 December to the Permanent Central Board set up under article 19, estimates of the quantities of each of the substances covered by the Convention to be imported into their territory for internal consumption during the following year for medical, scientific and other purposes.

"These estimates are not to be regarded as binding on the Government concerned, but will be for the purpose of serving as a guide to the Central Board in the discharge of its duties.

"Should circumstances make it necessary for any country, in the course of the year, to modify its estimates, the country in question shall communicate the revised figures to the Central Board."

[a] "State" is chosen in preference to "Government" to avoid confusion with stocks held by the Government for consumption in the country for other than government purposes.

2. *Scope*

The scope is doubly limited because these estimates are only to cover amounts of narcotics to be imported, and are not binding on Governments.

3. *Wording*

The text "for internal consumption . . . for medical and scientific and other purposes" is interpreted in various ways by Governments. Some consider it to cover all imports, regardless of the purposes intended. Others take it as referring to consumption of the substances as such, i.e., excluding quantities needed for the extraction of alkaloids and/or for conversion into other substances. Others, again, think that it includes these two uses, but to the extent that the products resulting from this extraction or conversion are to be used domestically. One Government actually took the view that only medical and scientific consumption was concerned, and excluded imports of opium to be used for the manufacture of prepared (smoking) opium.

The resulting disparity in the estimates received was enough to render them useless. There has been no authoritative interpretation of this text.

4. *Functions*

These are rather obscure and undoubtedly very limited; to serve ". . . as a guide to the Central Board in the discharge of its duties". In view of what has been said above, it is not surprising that they have led nowhere.

Suggestions. These estimates having no useful and clear cut functions should be abandoned altogether. Plans for limiting the production and regulating the distribution of "raw materials" are under consideration (see chapter VI), which will necessitate quite a different kind of estimate. As regards medicinal opium and the other preparations, we suggest they should be assimilated to drugs.

C. Estimates of "Drugs"

1. *Descriptive*

These estimates consist of the following items, listed in article 5, paragraph 2, of the 1931 Convention:

"(*a*) The quantity necessary for use as such for medical and scientific needs, including the quantity required for the manufacture of preparations for the export of which export authorisation are not required, whether such preparations are intended for domestic consumption or for export;

"(*b*) The quantity necessary for the purpose of conversion, whether for domestic consumption or for export;

"(*c*) The amount of the reserve stocks which it is desired to maintain;

"(*d*) The quantity required for the establishment and maintenance of any Government stocks as provided for in Article 4.

"The total of the estimates for each country or territory shall consist of the sum of the amounts specified under (*a*) and (*b*) of this paragraph with the addition of any amounts which may be necessary to bring the reserve stocks and the Government stocks up to the desired level, or after deduction of any amounts by which those stocks may exceed that level. These additions or deductions shall, however, not be taken into account except in so far as the High Contracting Parties concerned shall have forwarded in due course the necessary estimates to the Permanent Central Board."

2. *Scope*

The estimates cover the ground adequately and are satisfactory except under two heads:

(*a*) Paragraph (*d*) mentions the quantity required for the establishment and maintenance of any government stocks. As explained in chapter II on definitions, paragraph 6, it is necessary to know the total requirements of the State, and not only its requirements under stocks.

Suggestion. Use "The quantity necessary for State requirements."

(*b*) The inclusion of the amounts involved to bring reserve stocks up or down to the desired level (last two sentences of paragraph 2 of article 5, quoted above) has given rise to persistent difficulties. This information is not an estimate but the result of a mere arithmetical calculation which can easily be made by the Board or the Supervisory Body. It is only the difference between two elements known to them, viz., the actual stocks at the beginning of the year covered by the estimates and the levels of stocks desired during that year. If it is left to Governments to state these quantities, the result is that the figures they supply often bear no relation to actual stocks and desired levels—or that there are no figures at all. As these quantities play an important part, the working of the Convention is constantly hampered.

Suggestions. See chapter VII, section B, paragraph 2 (*b*).

3. *Wording*

(*a*) *Estimates.* See chapter II, section B, paragraph 4.

(*b*) *Text of sub-paragraph (a) of article 5 (2)* is often misunderstood by national administrations, "quantity necessary" being taken as meaning quantities to be

procured (e.g., imported); this sometimes causes nil estimates, because there is enough of the drug in stock, and sometimes inflated estimates, because part of the quantities to be procured are needed for replenishing stocks. Although this item is to cover consumption, the wording of the text is so complicated that only the most careful reader can ascertain from it that this is its intention. Partly for this reason, national authorities include in it amounts intended for the replenishment of stocks. The definition of exempted preparations is far too long and very few Governments know what these preparations are.

Suggestions. Mention and stress that this heading refers to probable consumption for legitimate, medical and scientific purposes. Shorten the description of exempted preparations, a clear definition of which should apear in article 1 of the Convention.

(*c*) *Text of sub-paragraph (b) of article 5 (2).* This is satisfactory but might be improved by ". . . conversion *into other drugs or other substances,* whether *these drugs or substances are intended* for . . .".

(*d*) *Text of sub-paragraph (c) of article 5 (2).* This has been interpreted in different ways by Governments. Some, perhaps on account of the word "desired", have declared the *ideal* stock they would like to see in the country, regardless of the actual possibility of bringing the stock up or down to this level. The desired level affects the quantities mentioned in the last two sentences of paragraph 2, quoted above, with the result that these quantities sometimes reduce the total of the estimates to nil and at others uselessly inflate it.

Stocks are seldom constant; they vary as quantities flow in or out. The term "to maintain" is therefore misleading to Governments. It has sometimes been taken to mean the safe minimum below which stocks should not be allowed to fall. And, as the quantities mentioned in the last two sentences of paragraph 2 are partly derived from the "level of reserve stock it is desired to maintain", the calculation of these quantities is often vitiated by wrong interpretations by Governments of the words "desired to maintain".

Suggestion. Use "The amount it is contemplated to have in stock at the end of the year".

(*e*) *Last sentence but one of article 5 (2).* The term "total of the estimates" is not always satisfactory. It is satisfactory, of course, when it includes only the estimates mentioned in sub-paragraphs (*a*) and (*b*); and it is also satisfactory when amounts required to replenish stocks have been added thereto. It is not satisfactory when the total of the estimates has been reduced by amounts to be deducted from stocks; in this case, the estimates under sub-paragraphs (*a*) and (*b*) have not been altered and individually remain valid, but the "total of the estimates" is inferior to their sum. Many Governments naturally fail to understand this point, however logical it may be.

Suggestion: Replace "total of the estimates" by "supply-limit".

(*f*) *Article 5 (2): summary of suggestions.* Summing up the suggestions in the preceding paragraph, and taking into account the scheme proposed in the following chapters for limiting manufacture and regulating distribution, paragraph 2 of article 5 might be reworded along the following lines:

"*Sub-paragraph* (a). The quantity probably to be consumed for medical and scientific purposes (including the amount to be used for the compounding of the exempted preparations defined in Article 1, whether such preparations are intended for domestic consumption or export).

"*Sub-paragraph* (b). The quantity probably to be converted into other drugs or other substances, irrespective of whether such drugs or substances are intended for domestic use or for export.

"*Sub-paragraph* (c). The quantity probably to be procured for State requirements as defined in Article 1.

"*Sub-paragraph* (d). The amount which it is contemplated to have in stock at the end of the year.

"The 'supply-limit' for each country or territory shall consist of the sum of the amounts specified under (*a*), (*b*) and (*c*) of this paragraph; the supply-limit shall be raised or lowered, as the case may be, by the difference between the stock actually existing at the beginning of the year, and the amount declared in sub-paragraph (*d*) above."

The last sentence of paragraph 2 of article 5 should be deleted.

4. *Functions*

The study of how the estimates have fulfilled their functions and suggestions for improving them cannot be dissociated from the study of the schemes for limiting the manufacture and regulating the distribution of narcotic drugs established by conventions. These are treated in chapters V and VII.

IV. STATISTICAL CONTROL

A. Descriptive

1. *Control under the 1925 Convention*[1]

Article 22 is the basis of the present system. This control should be the principal instrument at the disposal of the Board to determine whether " . . . excessive quantities (of narcotics) are accumulating in any country, or that there is a danger of that country becoming a centre of the illicit traffic . . . " (article 24). It covers all phases in the movement of narcotics, from production, manufacture, import, stocks, to all kinds of utilization; consumption, conversion, export, etc. It enables the Board to draw, for each country and territory, a yearly "balance-sheet" and ascertain whether the amounts utilized and the stock remaining at the end of the year tally with the supply available; or, in other words, to calculate the balance which should be in hand at the end of the year. When this balance does not tally with the stocks declared as actually being in hand, the Board asks the Government concerned for an explanation of this discrepancy.

2. *Control under the 1931 Convention*[2]

The further control created by the Convention of 1931, under which—generally speaking—supply and utilization are to remain within certain limits, is based both on the estimates provided for in that Convention and on the statistics furnished under the Convention of 1925 (except in the case of codeine and dionine, which were first placed under some kind of international control by the 1931 Convention).

B. Criticism

1. The statistics to be supplied to the Board under the 1925 Convention are generally well suited to the control foreseen both in this Convention and in that of 1931. The degree of success to be expected of this control, therefore, depends almost entirely on how accurate and complete these statistics are and how punctually they are furnished. These conditions have been fulfilled to a great extent, so far as manufactured drugs are concerned. They were not fulfilled in the case of raw materials.

2. How efficient the control created by the Convention of 1925 could be is illustrated by the sharp decline in the manufacture of morphine, diacetylmorphine and cocaine observed in the years after it came into effect. The control over raw materials, on the other hand, was vitiated at the source, by the poor quality, and even more often by the absence of statistics from some of the most important producing countries; the fault, of course, lies with the Governments concerned, not with the system itself.

3. If the additional control provided for in the Convention of 1931 has proved cumbersome and generally ineffective[3] the fault lies with the unsatisfactory provisions of this Convention, and not with the statistics to be furnished under the earlier Convention.

C. Suggestions

1. In a few instances, the provisions of the Conventions of 1925 and 1931 leave gaps in the statistical information asked of Governments:

(*a*) Under article 13 (2) (*c*) of the 1931 Convention, consumption of codeine and dionine is not to be declared.

Suggestion. If a "balance" is to be struck for these two drugs, consumption must be declared; and many Governments do so already.

(b) All the statistics needed for striking a "balance" are to be sent to the Board at the latest within three months following the end of the year. The statistics of stocks existing on 31 December, on the other hand, are only to be sent by Governments within the five months following the end of the year. As a result, the Board cannot ascertain for at least six months after the end of any year whether the declared stocks tally with the calculated balance. We see no reason for giving more time to Governments for reporting stocks than for reporting consumption, for example.

Suggestion. Statistics of stocks should be made available to the Board at the same time as the other annual statistics.

(*c*) Under the 1925 Convention statistics of Indian hemp and its resin and preparations of the resin are at present limited to exports, imports and confiscations on account of illicit export or import; for galenical preparations of Indian hemp, statistics are more complete, but do not include manufacture. Thus, for Indian hemp, in any form, there is no possibility of striking a balance. This gap may have been intentional, as, apart from statistics of the manufacture of galenical preparations, the missing information is perhaps not obtainable, and the point is mentioned here only for the sake of completeness.

[1] Such part of this control as relates to imports and exports is reviewed in chapter V: "Control of International Trade".

[2] For full details on this control, see chapter VII: "Limitation of the Manufacture of Drugs", and chapter V: "Control of International Trade".

[3] See chapter V, section C, on "Control of International Trade", and chapter VII, section A, on the "Limitation of the Manufacture of Drugs".

2. On the other hand, some information asked of Governments is of little use.

(*a*) Under article 22, paragraph (1) (*e*), Governments are to report ". . . the amounts . . . confiscated on account of illicit import or export; the manner in which the substances have been disposed of . . . with such other information as may be useful in regard to such confiscation and disposal". The only information which has proved useful and, indeed, indispensable, in the past twenty years, was that relating to that part of confiscations which were subsequently released for legitimate use; this constitutes additional "assets" to be brought into account. It does not help the Board to know the amounts confiscated on account of illicit *import*, in determining whether some country is becoming a centre of illicit traffic, because these amounts may be an aggregate of many confiscations, and the origin of the narcotics confiscated is not within the knowledge of the Board. On the other hand, the fact that narcotics are confiscated on account of illicit *export* will go to prove that the country in question is alive to the danger of illicit traffic and is combating it. Under article 23 of the 1931 Convention, full information on *all* cases of illicit traffic is to be exchanged with full particulars between Contracting Parties through the Secretary-General of the United Nations. This information is published by him. The publication by the Board of information relating to confiscations effected solely on account of illicit export or import, apart from constituting a duplication of work, is misleading; for it depicts only one side of the illicit traffic, and the amounts confiscated on account of domestic illicit production, manufacture or traffic are not included in it.

Suggestion: If the present general arrangements for the division of the work between various organs are retained, at least the following changes should be made. First, transfer to article 23 of the 1931 Convention (or its future equivalent) the provisions of article 22 (1) (*e*) of the 1925 Convention, relating to disposal of the amounts confiscated. Secondly, limit the provisions of article 22 (1) (*e*) of the 1925 Convention to the obligation for Governments to declare to the ICB, in the matter of confiscations, that portion of all confiscations which is released for legitimate use (i.e., either for immediate use, or to be placed in stock for future use), irrespective of whether the narcotics were seized on account of illicit export or import or domestic illicit traffic. We have, however, advocated the principle (see chapter VIII, section B) that there should be a strict division between the executive and administrative functions of the ICB and the policy-making functions of another body. If this principle is adopted, all the information regarding illicit traffic, while it can be sent for information to this second body, would be dealt with by the former and incidentally serve as a basis for decisions under article 24 of the 1925 Convention and judicial action.

(*b*) Under article 17 of the Convention of 1931, Governments should require manufacturers to submit quarterly returns on the amounts which have gone into, and come out, of factories, and on the stocks they keep; and, under the second sentence of article 22, they should include a summary of these returns in the annual statistics supplied to the Board. The information received has been of no use whatever to the Board; it complicates the statistical forms to be completed by Governments, and creates confusion. This means that the indispensable information asked for in the same forms suffers.

Suggestion. Delete the second sentence of article 22 of the 1931 Convention.

V. CONTROL OF INTERNATIONAL TRADE

A. General Principles

1. Under international conventions the international trade in narcotics is subject to the following measures:

(*a*) Imports and exports to be covered by import and export authorizations issued by, and exchanged between, Governments;

(*b*) Actual transactions to be reported by Governments to the Board;

(*c*) Imports not to exceed certain limits.

The first two measures are provided in the Convention of 1925,[4] the third in the Convention of 1931. The present chapter is therefore, divided into two parts according to those Conventions.

B. Control under the Convention of 1925

1. *Import and export authorizations*

We have little comment. The system is described in detail in the Convention of 1925 and other publications, and the Board in no way controls its application.

One important exporting country has, however, recently expressed the view that the three-month validity period of import certificates, which appears to have entered into common practice but is not prescribed in the Convention, often proves inconvenient to exporters, because it

[4] Except (*b*), in the case of codeine and dionine, which drugs were first placed under some kind of international control by the 1931 Convention.

is too short, and that it should be extended to six months. The same Government has suggested to us that it would be desirable for the forms of import and export authorizations to be obligatorily standardized, not merely as a recommendation, and universally adopted in a limited number of languages.

2. *Statistics*

(*a*) Statistics are supplied to the Board quarterly (except in the case of codeine and dionine[5]) under article 22 (2). Their object is to allow the Board continually to " . . . watch the course of the international trade . . . " (article 24); to ascertain whether exports duly reach their intended destination; and, thus to see whether centres of illicit traffic are developing.

(*b*) Generally speaking, these statistics have proven effective; they have made possible the discovery of leakages into the illicit traffic and the exposures of false statements regarding the destination of exports. They have also proved to be the most reliable statistics supplied to the Board. For it is easier to control imports and exports than to control consumption, production, manufacture, etc., because they involve import and export authorizations, the verification at customs posts and, last but not least, monetary transfers or barter.

(*c*) The Board is usually informed of one or the other side of these transactions (the export or the import), so that hardly a single transaction escapes its notice. When it possesses both returns, it is in a position to question any discrepancy between them. Many discrepancies, of course, are noted every quarter; they are the subject of incessant and voluminous correspondence between the Board and Governments. But the very fact that such questions can be asked, and that Governments are moved to make the necessary enquiries, speaks in favour of the system, even though it absorbs much of the time of the Board and its secretariat—as also of the national authorities, who are responsible for the discrepancies.

(*d*) Exports from one country to another often constitute a steady flow which, except in the case of codeine and dionine, can be followed from quarter to quarter; and, before taking action on discrepancies, the Board, to avoid continuously troubling Governments, usually waits for several quarters before determining whether or not the discrepancy is due merely to the fact that some transactions were not completed (goods despatched *and* received) during the same quarter. In the case of codeine and dionine, however, because statistics are supplied annually instead of quarterly, the Board has either to write to Governments in all cases at once or to wait for several years in order to determine whether or not there *is* a discrepancy.

[5] These two drugs are covered by only the 1931 Convention, and import and export statistics are to be sent only annually.

Suggestions. Measures are suggested later for rendering the control over trade established by the 1931 Convention more effective. Under these proposals the need for export and import statistics and the occurrence of the above-mentioned discrepancies would disappear.

C. Control under the 1931 Convention

1. *Descriptive*

This Convention purports *inter alia* to ". . . regulate the distribution of narcotic drugs . . ." (i.e., manufactured drugs) and to supplement the control, described above, of the 1925 Convention. The relevant provisions are:

Article 12, paragraph 2. "The imports in any one year into any country or territory of any of the drugs shall not exceed the total of the estimates as defined in Article 5 and of the amount exported from that country or territory during the year, less the amount manufactured in that country or territory in that year."

Article 14, paragraph 2. "If it appears from the import and export returns made to the Permanent Central Board or from the notifications made to the Board in pursuance of the preceding paragraph that the quantity exported or authorised to be exported to any country or territory exceeds the total of the estimates for that country or territory as defined in Article 5, with the addition of the amounts shown to have been exported, the Board shall immediately notify the fact to all the High Contracting Parties, who will not, during the currency of the year in question, authorise any new exports to that country except:

"(i) In the event of a supplementary estimate being furnished for that country in respect both of any quantity over-imported and of the additional quantity required; or

"(ii) In exceptional cases where the exports in the opinion of the Government of the exporting country is essential in the interests of humanity or for the treatment of the sick."

2. *General comments*

(*a*) Imports are unlike manufacture, in two respects. First, they are subject to limits based on a defined element, viz., the "total of the estimates". Secondly, they have not been subjected to *ex post facto* corrective action (i.e., "deductions"), and excessive imports, in one year, are not to be reckoned against the requirements for the following year.

(*b*) There seem to be two different limits, one under article 12 (2), the other under article 14 (2).

(*c*) No obligation is placed *expressis verbis* upon

the exporting country to keep its exports within the import-limit of the importing country, unless notified by the Board that this limit has been exceeded.[6] Even then, it may still authorize some exports (article 14 (2) (ii)).

3. *Article 14, paragraph 2*

The purpose of these provisions is clear, viz., to prevent countries from importing more than their estimated legitimate requirements. It is constantly defeated, for the following reasons:

(*a*) The exporting countries are not obliged to keep within the import-limit of the importing country (see paragraph 2 (*c*) above). Some—but not all—exporting countries, try to do this, but their efforts are of little avail, because they are unaware of exports by other exporting countries—which are perhaps equally well intentioned.

(*b*) Import and export statistics are to be despatched quarterly to the Board, within the four weeks following the end of each quarter, (except in the case of codeine and dionine). The returns relating to the last quarter of the year, therefore, do not reach the Board until some time after the turn of the year. Thus, if import excesses occur during that quarter, the Board is precluded from taking action under paragraph 2 of article 14. It is noteworthy that, for instance in 1946 and 1947, 110 excesses, or about 60 per cent of all the excesses, occurred in that quarter. With respect to codeine and dionine, action under article 14 (2) cannot be taken in any case, because the export and import returns are to be sent annually.

Article 12, paragraph 2

The purpose is obscure. Is this to constitute an *ex post facto* corrective of the above-mentioned defects in article 14 (2)? Hardly so, because it does not add anything, the limits set up under either article being made up of the "total of the estimates", plus exports or re-exports, and neither article expressly mentions any deduction of excesses. Is it conceivable, then, that the purpose is to set up an import-limit for countries which both import and manufacture—as the mention of manufacture might well suggest? Perhaps, but if so, the results are odd, owing to the fact that:

(*a*) Under article 7, imports are already a component of the manufacture-limit to be computed according to the provisions of chapter III of the Convention;

(*b*) The latter limit takes no account of the "total of the estimates", which, on the other hand, is the basic component of the import-limit under article 12 (2).

The odd effect—which constantly occurs—is that a manufacturing country, which has exceeded its manufacture limit under articles 6 and 7, may still have a large unused or unexhausted import-limit under article 12 (2). But, under article 7, any additional import would have further reduced the manufacture-limit and accordingly increased the excess manufacture.

This process of elimination leaves one possible conjecture: that the import-limit under this article is to apply to codeine and dionine, since it is impossible to calculate for these drugs a manufacture-limit under articles 6 and 7 (see chapter VII, section A, paragraph 3(*f*)) or to apply to them, even in theory, an import-limit under article 14 (2). If this is the purpose of article 12 (2), the import-limit under this article would be subject to the defects inherent in any *ex post facto* limitation.

D. Suggestions

1. *Scheme proposed*

To achieve the aims of article 14 (2), the control over international trade exercised by an international authority should be based, not on statistics supplied to it long after the transactions are completed (as is the case under the present Conventions), but on documents (i.e., import and export authorizations) issued before these transactions take place. This could be achieved as follows:

(*a*) The "supply-limit" mentioned in chapter III, section C, paragraph 3(*f*), would be the basic import and/or manufacture limit. It would rise or fall during the year, *inter alia*, with imports and/or exports; it might be desirable that the ICB should notify Governments of the extent to which the supply-limit has been reduced by imports and increased by exports, either after each transaction or once or twice annually.

(*b*) The import authorization would be sent to the ICB, who would compare the amounts asked for with the "supply-limit". If these amounts remain within this limit (account being taken, of course, of previous similar authorizations and of exports effected during its period of validity by the importing country), the ICB would forward it, duly endorsed, to the exporting country.

(*c*) All the exporting country would have to do is to issue two more carbon copies than are required at present of the export authorization, and mail the first upon issue to the importing country (in addition to the copy mentioned in article 13 (4) of the 1925 Convention), and the second to the ICB, immediately upon

[6] Such an obligation exists, in some cases under article 14 (1); these cases, however, have practically ceased to occur, as almost all the countries are now Parties to either the 1925 or the 1931 Conventions."

the departure (the date thereof being mentioned) of the shipment. This second copy sent to the ICB would replace *export statistics,* and the amount mentioned on it would be immediately credited to the "supply-limit" of the exporting country. The importing country should send the first copy mentioned above to the ICB, duly endorsed, immediately on receipt (the date thereof being mentioned) of the goods. This would replace *import statistics.*

(*d*) Whenever the ICB saw that an import authorization involved an excess over the "supply-limit" (see (*b*) above) it would hold it in abeyance and immediately inform the importing country; it would then be open to the latter to cancel or modify this amount accordingly or submit supplementary estimates.

2. *Comment on proposed scheme*

The above suggestions would succeed, where the 1931 Convention failed, in preventing imports from exceeding *estimated* domestic requirements. We believe, however, that a new convention should go further and expressly provide for corrective action when it emerges that an incoming supply has exceeded or fallen below *actual* requirements. This would be achieved, even in the case of purely importing countries, by the scheme suggested in chapter VII, section B.

3. *Effects of this scheme*

(*a*) Governments would be relieved of much responsibility and much work. These would be transferred to the ICB. On the other hand, as will be seen in the following paragraphs, a good deal of the Board's work, inevitable under the system at present in force, would no longer be necessary.

(*b*) The additional work of clearing import authorizations assigned to the ICB would be offset, to some extent, by a reduction in the correspondence at present conducted by the Board on account of discrepancies between export and import statistics and action under article 14 (2) of the 1931 Convention (see (*c*) and (*d*) below).

(*c*) The present import and export statistics would no longer be necessary, and discrepancies between exporters' and importers' returns could hardly occur.

(*d*) Exporting countries, whether individually or together, could not export in excess of the supply-limits of the importing countries as they stand at any given moment. Action under article 14 (2) would no longer be necessary.

(*e*) Importing countries would be discouraged from submitting inflated estimates, since, under the suggestions made in chapter VII, section B, "corrective" action is contemplated in all cases where supplies exceed or fall below *actual* requirements, even in the case of purely importing countries.

4. *Mechanism*

(*a*) From enquiries which we have made, it looks as if the number of transactions which at present take place annually would not exceed 5,000 to 6,000. This is based on actual figures from three of the principal exporters in the world, namely France, Great Britain and Switzerland, which aggregate about 4,000. If synthetic drugs were widely manufactured and entered widely into the international trade, these figures might, of course, rise speedily. With the present volume of transactions, it would seem however that the recording of these transactions by the ICB does not present an unmanageable or too expensive administrative problem. It is one which can probably most easily be solved through mechanical recording by accounting machines.

(*b*) There are, of course, a number of detailed questions to be considered which will arise in drafting the actual clauses, and such further questions as the desirability of entrusting the ICB with the duties of framing, printing and numbering the import and export authorizations and their distribution to Governments.

VI. LIMITATION OF PRODUCTION OF "RAW MATERIALS"

Preliminary remarks

Hitherto, under each head, we have included two sections, one descriptive and critical, and the other containing suggestions. In the present case there is no operative system to be criticized, though it is true that there are in existence draft articles[7] to be included in a new international convention, prepared under the auspices of the League of Nations. They constitute, however, a system which, in our opinion, is too complicated to work satisfactorily; the detailed criticism given below under section A supports this general criticism.

[7] League of Nations document C.175 M.104 1939.XI.

In these circumstances, we have considered whether it would not be possible to substitute a simpler mechanism for limiting the production of "raw materials". The suggestions under B are directed to this end.

A. Criticism of the Draft Scheme of the League of Nations

1. The defects of the 1925 and 1931 Conventions have been brought to light through practical experience gained during the many years of application of these two Conventions. In the absence of practical experience,

the criticism of a draft plan requires greater care than the criticism of existing Conventions. It should be stressed here again that the time which could be devoted to this study was limited and that this stringency was felt more when examining the above-mentioned plan for limiting the production of raw opium.

2. The system limiting the production of raw opium, outlined in the above-mentioned articles, is based on estimates and statistics, as is the system for limiting the manufacture of drugs. But the system foreseen for limiting the production of raw opium shows a marked improvement inasmuch as paper excesses (see chapter VII, section A, paragraph 3 (*c*)) are not to be deducted from the production during the following years; the inference is that only excessive production found in stock will be deducted. This major improvement is counterbalanced by certain defects.

3. The system can work correctly only if stocks, at any rate "emergency" and "government" stocks, are ascertained within the short period specified in the draft articles (article 6); according to past experience this period will certainly be insufficient. Then if these stocks cannot be ascertained by the specified date, Governments will be tempted to guess at them in order to determine the amount to be added to these stocks, to bring them to the desired level—an amount which is a component of the import and production limits. If they do this, the resulting figure will not be the real stock deficit, i.e., the deficit of imports or production that will be taken into consideration when calculating the limit, but a deficit which is the result of a guess. Thus the danger exists that the limit will be based solely on estimates, which Governments can inflate at their convenience. It is true that later on, when statistics are sent, the Control Authority will be able to verify whether the deficit in the emergency stock has been inflated; but no provision is foreseen to correct the limits and even if there were such a provision, by the time it could be brought into force, it could probably have no effect.

4. Even if the "emergency" and "government" stocks can be ascertained within this short period of three months, the calculation of the amount to be added to, or to be deducted from, these stocks, or any other stocks, to bring them to the desired level, would give rise to the same defects as are mentioned in regard to drugs in chapter III, section C, paragraph 2 (*b*); and the danger of having a limit based solely on estimates is thus confirmed. The real excess or deficit will only be taken into consideration accidentally—if Governments are accurate and conscientious.

5. The plan takes no account of stocks held by dealers and manufacturers in non-producing countries where the institution of a monopoly is not compulsory. Variations of these stocks will have a bearing upon the production just as will variations in the "regulating stock" and in "emergency stocks".

6. Under article 3 (paragraphs 2 and 3), the Control Authority is not compelled to establish all the estimates for the countries and territories which have not supplied them. If the Control Authority does not establish all the missing estimates of a given country, the limitation of its import or production will not be possible.

7. Article 11, whereby world production is determined, does not provide for the deduction foreseen in article 25 (1), viz., the quantity to be deducted from the "regulating stocks" to bring them down to the desired level.

8. Article 17 does not state *expressis verbis* that the supplementary estimates foreseen in article 6 should be included in the amounts authorized to be produced, nor does it contemplate the deduction provided in article 26, paragraph 6.

9. The plan is encumbered with unnecessary and even inapplicable provisions, viz., (*a*) the sub-division of the stocks into "regulating stocks" (articles 24 and 25) and an "emergency stock" (article 26), to which a third stock should be added, viz., the stock of dealers and manufacturers; (*b*) the delay for the furnishing of revised and supplementary estimates (articles 5 (paragraph 5 (ii)), 6 and 7).

(*a*) The two stocks foreseen in the 1931 Convention and defined as "reserve stock" and "government stock" have led to numerous interpretations (see chapter II, section B, paragraph 5, and chapter III, section C, paragraph 3 (*d*)). Therefore, the three stocks foreseen in the draft articles, which call for a fourth stock, will result in a multiplication of misinterpretations, not to speak of the different interpretations of the English and French texts (e.g., "emergency stock" was translated into French as *stock spécial*).

(*b*) The delays provided for the furnishings of supplementary estimates will create the difficulties explained under 3 above, and lead to the following situation: a country which has not furnished a supplementary estimate by 30 November will have to wait until the following year to satisfy a supplementary need.

10. Moreover, there are two inconsistencies in the mechanism of the plan:

(*a*) Under articles 11 (iv) and 17 (*c*), the world or national production limits respectively will be raised to cover the supplementary amounts exported during a preceding year. This procedure has been adopted as if it were expected that producers will not be able to meet these supplementary demands by production; but that

they will be met by the "regulating stocks". The replenishment of any depleted "regulating stock" is also foreseen in the same articles (articles 11 (v) and 17 (*d*)). Therefore, if the provisions of article 11 (iv) *and* (v) or of article 17 (*c*) *and* (*d*) are applied, supplementary exports will be taken into account twice in the production limits.

(*b*) The application of article 6 may also lead to an undue raising of the limit both for importers and producers. For example, if, at the end of 1950, actual emergency stocks amount to 20 tons and the contemplated "emergency stocks" to 30 tons, the limit calculated in 1951 for 1952 will be raised by 10 tons. If at the end of 1951 the stocks still amount to 20 tons, the limit calculated in 1952 for 1953 will again be raised by 10 tons. The result will be that the stocks at the end of 1952 will be increased to 30 tons and the stocks at the end of 1953 to 40 tons; they will thus be 10 tons too high. The same considerations apply to the "government stocks" and may also apply to the "regulating stocks".

(*c*) Under article 8 of the plan, it is mandatory for Governments, once they have notified the amounts they wish to import, to import that quantity during the year covered by the estimate. In practice, this provision would be very difficult to apply.

11. Apart from these technical criticisms, it should also be mentioned that clauses and provisions which are closely interrelated have been dissociated in the drafting of these articles, and are scattered. For example, the amount to be added to the "emergency stocks" to bring them up to the desired level is provided in article 6 (*a*); no less than nineteen articles have to be read in order to see that article 25 (6) provides for a deduction when the actual "emergency stocks" are higher than the level desired. This dispersal in itself makes it difficult to study the plan, let alone apply it. This last point is merely mentioned for the sake of completeness. No doubt, in subsequent revisions, the draft would have been amended in this respect.

B. Suggestions

1. *Preliminary remarks*

(*a*) We are aware that in the following plan two important points have not been fully dealt with or, indeed, dealt with at all.

(i) The first point is that, apart from the "raw materials" below, raw opium, coca leaves and Indian hemp, there are other raw materials some of which, e.g., for synthetic drugs, are used for the making of narcotics but themselves have no narcotic effects and are used for many other industrial purposes. The existence of these other "raw materials" evidently constitutes a special problem. This consideration does not, perhaps, apply to poppy straw, which, we believe, might be brought into the scheme of control as now presented, if and when estimates and statistics are obtained.

(ii) We are also aware that one of the crucial questions in considering any constructive scheme under this head is whether there should be an open or a restricted market. This question, bound up as it is with that of the creation of an international selling agency, has been deliberately omitted as raising financial, economic and even political questions with which we are not competent to deal. If a quota system could be instituted, it could operate only to simplify the system now proposed.

(*b*) Finally, we approach this part of the scheme for international control with much less confidence than the rest. Indeed, it would seem almost impossible to evolve any acceptable method of control in view of the fact that the national controls in this particular branch are entirely inadequate, and Governments unable to supply the information required. This is true of raw opium, more true of coca leaves, and most true of Indian hemp. Nevertheless, we have thought that this should not prevent us from putting forward such ideas as have occurred to us on the system which might be applied, and to attempt to define its application.

2. *Principles*[8]

(*a*) The object in view is to limit the production of "raw materials" to legitimate requirements. To this end, producing countries must know the amount of legitimate requirements for a given year before they authorize production (sowing, planting, etc.). The requirements must therefore be estimated; for only so can producers limit their production to the legitimate estimated requirements. Nevertheless, estimates, however well drawn up, will often vary one way or another from the actual, as distinct from the estimated, legitimate requirements. Production may vary for reasons independent of the will of Governments, e.g., in the case of agricultural production, weather, etc. It therefore becomes necessary to verify whether the actual production has corresponded to the actual needs. In fact, whether there has been a real excess or deficit of production. This leads logically to a limitation system involving two limits:

(i) A preliminary limit based on estimated requirements, and

(ii) A final limit based on what have proved to be the actual requirements.

(*b*) The second limit is necessary in order to correct the mistakes in the first, i.e., when an actual deficit or

[8] Throughout, by "conversion" is meant utilization for the manufacture of drugs or other products, such as prepared opium; the word "conversion" has been used for the sake of succinctness.

an excess in production has been ascertained, the next preliminary limit shall be increased or diminished *pro tanto* in order that producing countries may make up the deficits in their production or absorb the excesses in their production.

3. *Preliminary limit*

(*a*) The preliminary limit will be based on the estimated legitimate requirements. It will be calculated by the ICB on the basis of the estimates furnished by Governments. It is necessary that each producing country should know its own limit before production is undertaken. This consideration indicates the date on which Government estimates should be sent in, and also the dates on which the limit is to be fixed by the ICB. These dates will vary from substance to substance and should be inserted in the Convention.

(*b*) For instance, in the case of opium, the limit should be fixed in plenty of time for the producers to know how much they are to sow. This would probably be four or five months before they start sowing, and ten months to a year before the harvest; for the poppy is an annual plant.

(*c*) When we come to coca leaves, the problem is far more complicated; for, in the first place, the coca bush has to grow for five years before it yields any harvest; and, secondly, it is liable to grow wild, and no control over production is then possible. This problem seemed insoluble to the framers of the above-mentioned draft articles for a convention before the war, and we confess that we can see no solution to it. But, if they cannot be controlled in domestic production, there is no reason why they should not be subject to the same control as drugs (see chapter V, section D, of the present document) as soon as they enter international trade.

(*d*) The same considerations apply to Indian hemp.

4. *Estimates*

(*a*) Governments would furnish annual estimates of their requirements. These estimates should be approved, and not merely examined by the ICB. These estimates would be grouped under the following heads:

(i) Consumption;

(ii) Conversion;

(iii) State requirements;

(iv) Contemplated stock.

(*b*) Moreover, Governments would state the countries from whom they would secure their supplies and the amount required from each.

(*c*) The ICB would draw up estimates for countries which have not furnished them, and would fix the sources of supply. The countries concerned, whether as importers or as exporters, would be immediately informed and would be given the opportunity of rectifying the position.

5. *Calculation of the preliminary limit*

On the basis of the estimates sent by Governments, the ICB would calculate the preliminary limits of requirements:

(*a*) For countries which consume and/or convert these raw materials;

(*b*) For countries which consume and/or convert these raw materials, and, in addition, enter into international trade;

(*c*) For producing countries.

These limits would be calculated in the following manner:

(*a*) Preliminary limit: countries which consume and/or convert raw materials:

(i) Estimates of consumption, plus,

(ii) Estimates for conversion, plus,

(iii) Estimates of State requirements; plus or minus,

(iv) Quantities to be added to, or deducted from, the contemplated stock of the preceding year, in order to bring it to the level contemplated for the year in question, and approved by the ICB.

(*b*) Preliminary limit: countries which consume and/or convert, and/or re-export raw materials.

To the total estimates, as calculated for countries in group (*a*), there would be added exports calculated on the basis of the total estimates (preliminary limits) of the countries in group (*a*), in the proportions notified by them.

The preliminary limit of countries in groups (*a*) and (*b*) would constitute their import limit. Countries would not be entitled to exceed this limit, or obliged to import up to it. If the fact that Governments have not imported up to the limit of their estimates gives rise to excess production in other countries, this excessive production will be dealt with by a reduction of the amount approved for production in the following year (see paragraph 8 (*a*)).

(*c*) Preliminary limit: producing countries.

To the total estimates, as calculated for countries in group (*a*), there would be added exports calculated on

the basis of the estimates (preliminary limits) of countries in groups (*a*) and (*b*), in the proportions notified by them.

These limits would be communicated to all Governments, and in this way producing and re-exporting countries would be informed of what calls would probably be made on their supplies.

6. *Supplementary estimates*

(*a*) Governments would be enabled to send supplementary estimates. They would show the countries which were to be asked to meet these supplementary requirements. Supplementary estimates, once accepted, would be communicated to the countries concerned, whether importers or exporters.

(*b*) It might be that production would be inadequate to meet these increased requirements. In such cases, as soon as the deficit had been observed, the next preliminary limit of production would be *pro tanto* raised. In this way, it would be possible to avoid raising the preliminary limit of a country only to lower it later.

(*c*) Governments will be required to draw on their own stocks in order to cover their supplementary requirements before having recourse to supplementary estimates.

7. *Final production limit*

(*a*) The ICB would calculate on the basis of statistics furnished by Governments, the final limit of production. This limit would be calculated as follows:

(i) Actual consumption, plus,

(ii) Actual conversion, plus,

(iii) Imports and purchases for State requirements, plus,

(iv) Exports; plus or minus,

(v) Quantities to be added to, or deducted from, actual stocks to bring them to the contemplated level of stocks, minus,

(vi) Amounts seized and released to the illicit market.

(*b*) This production limit, calculated in the same manner for non-producing countries, would become the final import limit.

(*c*) In cases where a country which produces raw materials also imports them, the production limit would become the limit of import and production.

8. *Deficit or excess of production*

(*a*) The final limit of production would make it desirable to calculate the actual deficit or excess of production. In order to meet the deficit or absorb the excess, the production of the succeeding years would have to be increased or diminished; hence the next preliminary production limit would have to be proportionately raised or lowered according as there had been a deficit or an excess, account having been taken of the raising or lowering of the current preliminary limits previously effected for similar reasons.

(*b*) The same method would be adopted for deficits or excesses of imports.

(*c*) As regards substances, e.g., coca leaves for which no preliminary limit can be established, when the ICB had observed an actual production excess, the responsible Government might be invited to reduce its production proportionately, within a period to be agreed.

(*d*) Any excess production should be explained by the Government concerned which should state the measures taken to remedy the situation. Governments which had exceeded estimates should give the reasons to the ICB. These explanations could be published at the discretion of the ICB.

C. Comments on Suggestions

1. *Obligations of Governments*

(*a*) Governments would communicate to the ICB:

(i) Estimates of their requirements for consumption, conversion, for the State, and the contemplated stock level; and

(ii) Statistics.

(*b*) It will be observed that the number of data required from Governments has been reduced to a minimum. This is desirable because the more information is sought, the more time is necessary to obtain it and the more problems are created. A plan for limitation should not depend upon the punctuality of returns for the good reason that, hitherto, statistics sent under the existing Conventions are sent by the producing countries to the Board with a delay of several months, and often of several years—if indeed they are sent at all. Such delay would not prevent the mechanism of limitation from working. It would only delay its application and then only in the case of countries which are late.

(*c*) Estimates for conversion are easily established. They can be calculated from estimates of the amount of drugs which are required and are to be obtained from the raw materials; and these estimates are already furnished under the existing Conventions.

(*d*) The real difficulty lies in drawing up consumption estimates. As regards raw opium, India is one of

the few countries which declared consumption; it has a national control and, therefore, it may not be impossible to obtain estimates. But in Iran, where there is a large production and a large consumption, it would, judging from the past, be impossible to obtain any statistics or estimates at all, let alone accurate ones.

As regards coca leaves, the situation is likely to be even worse. For the Latin-American countries, where they are chewed, have no control over consumption, or if they have one, it is ineffectual, to judge by the statistics which are sent under the existing Conventions. It appears that in some countries taxes are collected on coca leaves sold to consumers. In so far as this is true, there must be some sort of control. In any case, the principal countries which consume "raw materials" produce it themselves, with the exception of Argentina, which imports coca leaves. Therefore, the problem is, in the main, a national one and raises hardly any difficulty of an international kind.

(*e*) As regards opium and coca leaves, complete statistics are already required under the existing conventions. There should, therefore, be no new difficulties under this head. Complete statistics are not required for Indian hemp, and this gap would have to be filled. But here again, for all these substances it should be repeated that, after twenty years of international control, producing countries, Parties or non-Parties to the Conventions, if they furnish statistics at all, send them incomplete, inaccurate and late. No scheme, however carefully devised, can be expected to work if there is not a minimum of accurate and punctual information from Governments.

2. *Obligations of the ICB*

The ICB would:

(*a*) Establish all estimates not furnished by Governments;

(*b*) Calculate the limits:

(i) On the basis of estimates (preliminary limit);

(ii) On the basis of statistics (final limit).

These limits would be communicated to Governments. The ICB would establish the actual deficits and excesses in production or imports and take the necessary steps.

3. *Extent of control*

(*a*) Excesses would be treated as follows, in accordance with the suggestions made above:

(i) *Consumption,* to be explained by Governments;

(ii) *Conversion,* to be explained by Governments;

(iii) *State requirements.* In this case only, no explanation would be required;

(iv) *Exports,* would be limited to their destination. Trade would be subject to the measures proposed in chapter V, section D;

(v) *Production,* to be explained by Governments, supervised and absorbed;

(vi) *Stock* (in fact, the production excess), ditto.

(*b*) In short, all the excesses would be taken into consideration; the utilization over and above estimates, i.e., "paper excesses" or under-estimates, would have to be explained; real excesses would be supervised and absorbed as soon as possible by a corresponding diminution of production.

(*c*) There would be no "paper excesses" to be deducted from the production of subsequent years as is done now in the case of manufacture. Only real excesses would be deducted.

(*d*) The system allows freedom of trade to subsist. This has the following advantages:

(i) Existing treaties of commerce are not disturbed;

(ii) No financial difficulties, e.g., transfer problems, are created.

4. *Preliminary limit*

(*a*) *Advantages.* The system of preliminary limits should not be taken as a regimentation which prohibits, but rather as a guide leading to limitation—a limitation which, moreover, is consistent with its economic principles. Indeed, it is economically and socially undesirable in this particular case for a Government to overproduce a dangerous substance.

(*b*) *Dangers.* Every system based on estimates involves dangers when the estimates are inflated. In this case, the preliminary limit goes far beyond the quantities required and countries are induced to produce more than necessary to cover actual legitimate requirements. This inevitable defect, inherent in preliminary estimates, is corrected at a later stage by the system of final limits. Nevertheless, Governments should be invited to estimate below rather than above the figures of the previous year. Later, if necessary, supplementary estimates can be sent.

5. *The role of stocks*

Stocks play an important role.

If production exceeds actual requirements, the excess goes into stocks, which become inflated. It might be

well to establish criteria for determining the contemplated level of stocks. A contemplated stock should be enough to act as a compensatory balance between production and requirements; however, production and requirements may vary independently of the will of producers and consumers.

VII. LIMITATION OF THE MANUFACTURE OF DRUGS

A. Present System

1. *Principles*

(*a*) The first object of the 1931 Convention is stated in its preamble ". . . the limitation of the manufacture of narcotic drugs to the world's legitimate requirements for medical and scientific purposes . . .". Although the Convention does not state *expressis verbis* how this goal is to be reached, this can be ascertained by inference:

(i) The legitimate requirements of each country and territory in the world, and thereby the whole world's legitimate requirements, are determined by means of "preliminary" estimates;

(ii) Supplies in each country and territory—and thereby in the whole world—are not to exceed legitimate requirements, the latter being computed on the basis both of estimates and of statistics of actual movement;

(iii) The estimated requirements of all countries and territories are made known to Governments and published by the Supervisory Body by the beginning of the year covered by the estimate. Each manufacturing country is to limit its production to its own legitimate requirements, increased, as the case may be, by amounts ordered by other countries or territories for their legitimate requirements.

(*b*) Thus, if each manufacturing country limits its production to the amount needed for its own legitimate requirements, and if, in addition to the manufacturing countries produce among themselves the amount needed to meet the legitimate requirements—and not more—of the non-manufacturing countries and territories, the limitation of manufacture to the world's legitimate requirements has been achieved.

2. *Criticism: general*

(*a*) We have no remarks to make on the theory of these general principles. No other basis suggests itself to achieve limitation of manufacture to the world's legitimate requirements, short of replacing national production by international manufacturing centres, operating on a co-operative basis under international control, and we do not believe that the time has come when Governments would be willing to accept such a solution.

(*b*) On the other hand, the clauses into which these principles have been translated and the mechanism which has been set up to carry them into effect, both leave much to be desired. The main defects in the clauses are lack of clarity as to the exact functions of the estimates, and the fact that these clauses are too weak in some respects and too stringent in others.

(i) *Lack of clarity.* Estimates are obtained under various headings specified in the Convention, and their sum or "total of the estimates" is defined in article 5, paragraph 2. For any drug, once these estimates are published by the Supervisory Body, the "total of the estimates" of a given country represents the total requirements of that country. Therefore, it ought to serve as the manufacture-limit of that country (increased by exports, if any); if not, the purpose of the estimates is obscure. But, is this "total of the estimates" the limit foreseen by the Convention, to which a manufacturing country must adapt its production and which enables it to feel safe from excessive manufacture, so long as it remains within that limit? The term "total of the estimates" occurs three times in the Convention: in article 5, paragraph 2, where it is merely defined; in articles 12 (2) and 14 (2), where it is given a function relating to imports and/or exports—but not to manufacture. Chapter III of the Convention is headed "Limitation of manufacture"; it begins with the words (article 6) "There shall not be manufactured in any country or territory in any one year a quantity of any of the drugs greater than. . . ". The term "total of the estimates" does not appear at all in this chapter. Thus, it is clear that the "total of the estimates" is not meant to be the manufacture-limit, and that this limit is to be computed solely according to the provisions of chapter III, articles 6 and 7. Under these latter provisions, estimates—but not necessarily their "total"—may, under certain conditions, become a component of the manufacture-limit. In fact, taking the "total of the estimates" as a manufacture-limit almost inevitably leads to excesses over the limits computed according to articles 6 and 7.

(ii) *Weakness.* The powers of the Supervisory Body are limited to "examining" the estimates and asking for ". . . any further information or details . . . in order to make the estimate complete or to explain any statement made therein". It cannot amend an estimate without the agreement of the Government concerned. All it can do when it disapproves of an estimate is to include, in the Annual Statement of Estimates, ". . . an account of any explanations given or required . . . and any observation which (it) may desire to make in respect of any such estimate or explanation, or request for an explanation".

The objectionable estimate nevertheless remains valid.

(iii) *Stringency.* Under chapter III, manufacture-limits are to be based on items of actual utilization, within the limits of the corresponding estimates. This means that the limits are based either on actual utilization or on estimates, whichever is lower. And an unexhausted estimate under one head does not cancel an excess under another.

3. *Criticism; in detail*

(*a*) Machinery for limiting manufacture to legitimate requirements is provided for in articles 6 and 7, which read as follows:

"*Article 6*

"1. There shall not be manufactured in any country or territory in any one year a quantity of any of the drugs greater than the total of the following quantities:

"(*a*) The quantity required within the limits of the estimates for that country or territory for that year for use as such for its medical and scientific needs including the quantity required for the manufacture of preparations for the export of which export authorisations are not required, whether such preparations are intended for domestic consumption or for export;

"(*b*) The quantity required within the limits of the estimates for that country or territory for that year for conversion, whether for domestic consumption or for export;

"(*c*) Such quantity as may be required by that country or territory for the execution during the year of orders for export in accordance with the provisions of this Convention;

"(*d*) The quantity, if any, required by that country or territory for the purpose of maintaining the reserve stocks at the level specified in the estimates for that year;

"(*e*) The quantity, if any, required for the purpose of maintaining the Government stocks at the level specified in the estimates for that year.

"2. It is understood that, if at the end of any year, any High Contracting Party finds that the amount manufactured exceeds the total of the amounts specified above, less any deductions made under article 7, paragraph 1, such excess shall be deducted from the amount to be manufactured during the following year. In forwarding their annual statistics to the Permanent Central Board, the High Contracting Parties shall give the reasons for any such excess."

"*Article 7*

"There shall be deducted from the total quantity of each drug permitted under Article 6 to be manufactured in any country or territory during any one year:

"(i) Any amounts of that drug imported including any returned deliveries of the drug, less quantities re-exported.

"(ii) Any amounts of the drug seized and utilised as such for domestic consumption or for conversion.

"If it should be impossible to make any of the above deductions during the course of the current year, any amounts remaining in excess at the end of the year shall be deducted from the estimates for the following year."

(*b*) These provisions immediately suggest the following comments:

(i) The limits of manufacture are narrow in the extreme, for, as explained above, the factors taken into account on the positive side of the calculation are either amounts actually utilized or the corresponding estimates —*whichever are lower*. And an unexhausted estimate under one head does not cancel an excess under another;

(ii) These limits are awkward to calculate, either for Governments or the Board. No fewer than *nine elements of actual movement* have to be ascertained and taken into account—consumption, conversion, stocks at the beginning and at the end of the year, and difference between them, government requirements, exports, imports, seizures released; *and no fewer than five estimates*—consumption, conversion, desired level of stocks, quantities involved in bringing actual stocks to that level, government requirements.

(*c*) Regarding point (i) above, experience has shown that excess manufacture under articles 6 and 7 is usually due, in whole or in part, to the fact that actual utilization (consumption, conversion, government needs) has proved to be higher than the respective estimate. In such circumstances, when enough has been manufactured to meet the under-estimated requirements, an excess manufacture has automatically occurred, under articles 6 and 7. In other words, under-estimating automatically results in over-manufacturing. But all such excesses exist only on paper, because the drug has been used and is no longer available on the market.

(*d*) Regarding point (ii) above, we believe that hardly any Governments realize that they should make this calculation, or know how to make it; for, whereas the limits are exceeded every year by practically every manufacturing country, for one drug or another, it has only once happened that a Government has spontaneously given (as stipulated in paragraph 2 of article 6), the reasons for an excess, when forwarding its annual statistics.

(*e*) In practice, the Board calculates the limit, when it can, and draws the attention of the Governments concerned when these limits are exceeded. Such replies as

have been received to such notifications generally substantiate the statement made in the first sentence of the preceding paragraph. The Board, however, often cannot make this calculation. It cannot do so, first, when any single of the eight statistical forms to be filled in by Government, and containing the necessary information in actual movement, is missing, and, secondly, when a Government has not itself supplied estimates. In the second place, the estimates are established by the Supervisory Body; but the latter establishes only estimates of consumption and conversion, having decided, rightly or wrongly, that it cannot establish "the amount of the reserve stock which it is desired to maintain". This, in turn, makes it impossible to determine the quantity mentioned in article 6, paragraph 1 (*d*).

(*f*) In any case, manufacture-limits cannot be calculated with respect to codeine and dionine, for the Convention does not stipulate that statistics of consumption shall be furnished to the Board for these.

(*g*) In short, for this machinery to function, two conditions are required:

(i) Complete estimates and statistics must be supplied by Governments for the manufacture-limit to be established;

(ii) A day-to-day check, by Governments, of the movement of drugs under the nine statistical items needed for the calculation of this limit, against estimates and actual manufacture, in order to slow down manufacture or send supplementary estimates, if and when necessary. Even if actual requirements were originally estimated with extreme accuracy, i.e., down to the last kilogramme, this check would be necessary, because exports and returned deliveries cannot be anticipated—let alone confiscations.

(*h*) The first of these conditions is an obligation upon Contracting Parties, clearly stated in the Convention. The second condition is not stipulated in the Convention, and would be extremely difficult to fulfil. In fact, only one Government appears to have managed to keep manufacture of a single drug exactly to the limit under articles 6 and 7. The country was Japan; the drug: heroin.

(i) Excess manufacture is not too disquieting when it occurs accidentally and if manufacture is reduced correspondingly in the next year. Article 6 of the Convention contains provisions to that effect. These, however, are as unsatisfactory as the rest of the scheme. First they make it even more complicated to calculate the manufacture-limit under articles 6 and 7, adding, as they do, one more element to the fourteen already to be taken into account, i.e., the excess from the previous year. Secondly, in only one case can the deductions actually be effected, i.e., when, at the end of the year, utilization for every single purpose except stock has remained within the limit of the estimates; then the surplus is in stock and is available for use in the following year. In the other cases, the surplus exists only on paper (see paragraph 3 (*c*) above) and is not available for use in the following year. If the letter of the Convention is applied, this paper excess will be carried over from one year to the next; accurate estimates in the subsequent years will not blot it out. If, on the other hand, there is another under-estimate, it will go to swell the original paper excess and so on endlessly until the ludicrous situation is reached when the paper excess is larger than the sum of manufacture during the year, and the stock at the end of it. Indeed, it will continue its course.

(*j*) Again taking the letter of the Convention, even an excess which is not a paper one and represents several times the total of annual requirements of the manufacturing country may be cancelled by ceasing to manufacture for one year; for if no manufacture has taken place in any one year, there can be no excess manufacture that year to be ". . . deducted from the amount to be manufactured during the following year".

(*k*) It will also be noted that some deductions are to be made from the quantities "to be manufactured" (paragraph 2 of article 6) and some from the "estimates" (last sentence of article 7). But the two items on account of which deductions might have to be made from "the estimates" (returned deliveries, re-exports, seizures released) are precisely those for which there are no estimates, as they cannot be forecast; and if the deduction were made direct from the "total of the estimates", the remaining amount would no longer be the total of the other items of estimates. Moreover, even if such deductions were possible, it is not stated who should effect them: the Government concerned, the Supervisory Body or the Board? This latter remark also applies to the last sentence of article 8, regarding conversion.

B. Suggestions

1. *Principles*

(*a*) The object of the following suggestions is not only to make the present system of limiting manufacture simple and more effective, but also to arrive at a system which could be applied in all cases, whether a country only manufactures or only imports, or does both. It would therefore be more correct to say that it purports to limit not only the manufacture of drugs, but the whole supply.

(*b*) Its main principles are to remove the anomaly of having, on the one hand, in some of the provisions of

the 1931 Convention, great weakness, and extreme—but generally theoretical—stringency in others; to help Governments to know their limits at any given moment; to avoid paper excesses and, at the same time, discourage Governments from inflating their estimates; and, finally, to provide some possibility of deducting real excesses.

(*c*) It will be observed that these suggestions place more emphasis upon actual requirements than on estimates. This tendency is dictated by fifteen years' experience of the application of the 1931 Convention and is not inconsistent with the aim of any convention purporting to limit ". . . the manufacture of narcotic drugs to the world's legitimate requirements. . . .". What really counts is whether manufacture exceeds, not estimated requirements, but actual requirements. For only when manufacture exceeds requirements can a surplus be found in stock at the end of the year, and if it is to be available for use in the following year and has to be deducted from amounts to be manufactured, it has to be in stock. The stock at the end of the year reflects the whole movement during the year and is, therefore, the only real index for determining whether supply is excessive or not.

2. *In detail*

(*a*) The ICB should have greater powers than merely "examining" the estimates and publishing correspondence and comments thereon.

(*b*) The "supply-limit" (see chapter III, section C, paragraph 3 (*f*)) would be a first statement of the amount to be procured during the year. It would be altered by only unforeseen elements: exports, returned deliveries, deductions on account of previous excesses and seizures released for legitimate use and, of course, by supplementary estimates. The supplementary estimates would not include amounts involved in bringing stocks up or down to the amount it is calculated having in stock; these amounts would be calculated by the ICB and credited by it to the "supply-limits" of the countries concerned.

(*c*) Apart from changes in wording from suggestions made in chapters II and III of the present document, the following amendments should be introduced in chapter III of the Convention of 1931, in order to translate the principles set forth in the above paragraph and in chapter V, section D. Chapter III of the 1931 Convention should be headed: "Limitation of Supplies", and article 6 should run on the following lines "There shall not be manufactured *or imported*. . .". Secondly, the words "within the limits of the estimates for that country or territory for that year" should be deleted wherever they occur in article 6; this would avoid "paper" excesses. Governments, on the other hand, would have to give the reasons for any utilization in excess of an estimate.[9]

(*d*) It will be observed that, even if the present system were to be maintained, the words "at the level specified in the estimates for that year", which appear in article 6 (1) (*e*), should be deleted, for no such level is to be specified or declared by Governments.

(*e*) Sub-paragraph (i) of article 7 should be deleted, and sub-paragraph (ii) should be listed in article 6, as a negative factor, immediately after the positive ones, together with the "deductions" mentioned in the last two sentences of paragraph 2 of article 5. These, however, as said above, should be calculated by the ICB. The remainder of article 7 should also be deleted.

(*f*) Under article 6 so revised, there would be an excess supply only when the total amount of the supply obtained during the year (i.e., manufacture, imports, seizures released, excess carried over from the preceding year) exceeds the total actual requirements plus exports. And, under this scheme, such an excess would invariably emerge in the form of a corresponding excess in the stock at the end of the year over the contemplated stock which had been approved, and not merely "examined", by the ICB. Thus, there would be no need for long calculation by Governments, and no question could arise as to whether the excess, being actually in stock, was available for use in the following year and could be deducted from the supply to be procured in that year. This deduction would be made automatically as foreseen under paragraph (*b*) above.

(*g*) As soon as the ICB has determined that deductions should be made, whether under (*e*) or (*f*) above, it should make the deduction, the amounts in question being deducted from the "supply limit" and the Governments concerned notified.

(*h*) Article 8 should be deleted. The amount which this article mentions as being unused in that year would be found in the stock at the end of the year, thus creating a real excess.

(*i*) It is hoped that the above suggestion will give an idea of how the mechanism created by the 1931 Convention could be adapted to attain the object we all have in view. If it proved desirable to make some such adaptation and use the above suggestions for this purpose, then it would also be necessary to take into account the suggestions in chapters II and III. Moreover,

[9] This is the present *de facto* procedure in cases of "paper" excesses. In the past, when Governments were asked the reasons for such excesses, they generally explained that this or that utilization had exceeded the estimate—a fact which the Board already knew. Answers of this kind eventually moved the Board to modify the form of its enquiry and ask in the first place why this or that utilization has exceeded the respective estimate.

it would be necessary to introduce clauses ensuring that all the elements required to establish limits will, in fact, somehow be furnished. For instance, if a country fails to supply estimates, the ICB should establish them, not only under certain headings, as done by the Supervisory Body at present, but under all headings. And, if a Government fails to send some statistics on actual movement, the missing statistics should be replaced in the calculation of limits by the corresponding estimate approved or established by the ICB.

VIII. ADMINISTRATIVE

Preliminary remarks

We have described above the changes which we should advocate in the existing system of limitation and control. How should the new arrangements we propose be administered? This section naturally falls into two sub-sections: national controls and international control. As before, we propose in each case to state first what the disadvantages of the present arrangements are, and then proceed to make proposals for changes.

A. National Controls

1. *Present position and criticisms*

(*a*) The provisions for the setting up of national controls occur in article 15 of chapter VI of the 1931 Convention, which runs as follows:

"The High Contracting Parties shall take all necessary legislative or other measures in order to give effect within their territories to the provisions of this Convention.

"The High Contracting Parties shall, if they have not already done so, create a special administration for the purpose of:

"(*a*) Applying the provisions of the present Convention;

"(*b*) Regulating, supervising and controlling the trade in drugs;

"(*c*) Organising the campaign against drug addiction by taking all useful steps to prevent its development and to suppress the illicit traffic."

(*b*) There are special administrations in many of the countries Parties to the Conventions, and their territories but they vary enormously. Some countries have an elaborate special control, more or less autonomous with its own police, etc.; others, not necessarily the inefficient ones, have a small separate section in an existing ministry (e.g., Ministry of Internal Affairs, Ministry of Health, Ministry of Agriculture) with only a handful of officials who use the central police force, customs service, etc., for their domestic control. In many of the small colonies, territories, etc. there has, of course, not been created any special administration, and the work is done, e.g., by the Medical Officer.

(*c*) There is considerable variety in the practice adopted by different metropolitan countries in regard to their colonies, territories, etc. Some countries leave colonies and territories free to send their returns direct to the Board and the Supervisory Body; others—and this tendency has been increasing of late—are establishing a kind of control, whether for economic or other reasons, over the execution of the Conventions by their colonies and dependencies. These latter metropolitan governments arrange that all the returns from colonies, etc., should go through the metropolis.

(*d*) Some countries have inefficient administrations. Sometimes this is due to indifference, sometimes to insufficient financial provision. In one small country, the special control consists of a single official without a secretary, who goes round on a bicycle inspecting the chemists' shops and making such notes as he can of their stock, etc. In some countries the legislation is inadequate; in others, the legislation, though adequate, is not applied. In others again, natural conditions make certain forms of control almost impossible to apply.

(*e*) Whatever their cause, deficiencies in the national administrations, so far as we have had occasion to observe them, show themselves chiefly in connexion with inaccurate statistics leading to discrepancies; failure to observe the limits imposed by the Conventions; misunderstanding of the terms of the Conventions; failure to answer letters; sending statistics late, or not at all.

(*f*) The weakness, indifference and helplessness of many administrations have imposed a limit upon the extent to which the purposes of the conventions have been attained. As has been seen above in several chapters, e.g., in particular, in chapter IV, "Statistical Control", administrations have been unable or unwilling to supply the basic information required in order to enable the international bodies to perform their duties; and in this respect the situation substantially deteriorated with the recent war. In its 1947 report (document E/OB/2), the Board made the following statement:

"It should be remembered, in connexion with the application of future conventions, that in the additional matter of sending returns by a given date, most Governments, though not all, habitually neglect the obligations they have undertaken; and that if they did not con-

stantly receive reminders, the volume of reports received would soon dwindle.

"It is difficult to know how far this deterioration is due to a general decline in administrative efficiency, or to lack of personnel and funds, or to disruption caused by the war. There are some signs of improvement, and it is hoped that gradually, the pre-war situation will be restored."

And again:

"To sum up, it may be said that the fulfilment by Governments of their obligations to send estimates and statistics has been steadily improving since the end of the war, but that it is still far from satisfactory. It is not sufficiently realised that the sending of punctual and accurate statistical information to the Board is not an act of grace on the part of Governments, to be abandoned or suspended according to the convenience of the moment, a change of Government, or some other domestic event, but a serious contractual obligation undertaken in an international treaty *vis-à-vis* all other Governments; and if this obligation is not fulfilled, the system of control which Governments intended to institute, and which those Governments which carry out the Conventions in good faith are trying to 'work' effectively, will break down. How true this is emerges in the next section of this report.

"It would be difficult at the present moment to select even a few Governments which carry out completely—that is to say, accurately and punctually—all the obligations they have assumed under the 1925 and/or the 1931 Conventions. Some Governments do not realise that they have assumed obligations; others which, no doubt, do realise their obligations are, for one reason or another, not prepared to live up to them."

As regards raw opium, the Board regretted "to state that the aim of the Convention of 1925 has not been attained, the desired control being vitiated at its source owing to the lack, or the poor quality, of statistics concerning the four most important producing countries"—China, Iran, India and Turkey.

In its last report for 1948 (document E/OB/4), the Board again stated: ". . . it is impossible, twenty years after the coming into force of the Convention of 19 February 1925, to determine even approximately the total world production of raw opium and coca leaves. This gap is very regrettable as these two substances are both used as raw materials for narcotic drugs and are consumed with harmful effects."

(*g*) No doubt one cause of inefficiency in the national controls, in their relation with international authorities, is in many countries due to the language difficulty. Since the Board's forms have been translated into Spanish, and since its correspondence with the technical authorities in Spanish-speaking countries has been conducted in Spanish, a certain improvement has been observed. It is not sufficiently realised that the documents of the Board and Supervisory Body, e.g., the statistics published by the Board and the statement published by the Supervisory Body, and their forms, are not like many international reports—documents prepared for the information principally of Foreign Offices. They are actual working documents to be used daily by the technical officials of the national controls. The officials of these controls are less likely than the officials of Foreign Offices to know or have access to foreign languages, and, for this reason, it is important that these documents should be made available in as many languages as possible.

2. *Suggestions*

(*a*) It is difficult to say what provisions could be inserted in the Conventions in order to strengthen the weaker administrations. There is obviously a limit to the amounts which countries, especially those which have been impoverished by war, are prepared to spend on this kind of control.

(*b*) The system adopted in the 1925 and 1931 Conventions has been to throw the major responsibility and expense for control, in the first instance on national authorities and impose on the international authority only an *ex post facto* control or check. The experience of the last twenty years has shown that, for one reason or another, Governments have not been able to carry out fully their part. And it is for this reason, among others, that in the suggestions made above some of the responsibility and work have been transferred from them to the international authority which it is proposed should be created. It is believed that this will be in the interest of Governments in that it will relieve them of some degree of responsibility and expense, and, also, that it will improve the control.

(*c*) The necessity for efficient national controls will, however, of course, exist and under this head we have the following proposals to make:

(i) It would be desirable that there should be a congress—say every three or five years—of the technical controllers of the different metropolitan countries and some of the principal colonies. These meetings should not be, it is suggested, in the nature of governmental committees, whether executive or advisory, or of governmental conferences which pass recommendations, give advice and make reports on which action is directly based. They should be in the nature of the many technical scientific congresses which take place, and directed in the first instance to the pooling of experience and the exchange of knowledge;

(ii) There is another possible suggestion which we think we may mention even though it could probably not find a place in a new convention. An arrangement was made before the last war in the field of public medicine, and also in that of economic statistics, which led to fruitful results. It consisted in arranging that certain advanced countries would allow officials of less experienced countries to come and study their more advanced mtehods. Arrangements were then made for a careful selection of suitable officials, preferably young, open-minded and intelligent, to be sent on study tours to these countries. On his way to and from his tours, each "student" spent a week or a fortnight in the international centre in order to learn something of the methods and desiderata, and was required to make a confidential report at the end for the international centre which had arranged his trip. The advantages of such an arrangement are obvious. The difficulty is to find the money. The less advanced countries are likely to be poorer ones; and they are not likely to be able to find money for such scholarship tours. Moreover in order to be effective, it requires a rather careful little administration at the international centre, which also costs money. The schemes which existed before the war, and to which we have referred, were financed by the Rockefeller Foundation; or, possibly, such a scheme might be financed officially through the United Nations.

(*d*) The question arises whether anything can or should be put in a new convention on this subject. Perhaps the most suitable thing would be to earmark the matter for insertion in a recommendation or *vœu* at the end of the conference; unless, indeed, it were possible to insert in the convention itself some declaration of willingness by Governments to receive such scholarship students if asked to do so and to give them facilities.

B. International Control

Preliminary remarks

The two authorities engaged in the control created by the Conventions with which we are directly concerned are the Board and the Supervisory Body.

1. *Permanent Central Board—Convention of 1925, as amended in 1946*

"*Article 19*

"A Permanent Central Board shall be appointed, within three months from the coming into force of the present Convention.

"The Central Board shall consist of eight persons who, by their technical competence, impartiality, and disinterestedness, will command general confidence.

"The members of the Central Board shall be appointed by the Economic and Social Council of the United Nations.

"In making the appointments, consideration shall be given to the importance of including on the Central Board, in equitable proportion, persons possessing a knowledge of the drug situation, both in the producing and manufacturing countries on the one hand, and in the consuming countries on the other hand, and connected with such countries.

"The members of the Central Board shall not hold any office which puts them in a position of direct dependence on their Governments.

"The members shall be appointed for a term of five years, and they will be eligible for reappointment.

"The Central Board shall elect its own President and shall settle its rules of procedure.

"At meetings of the Board, four members shall form a quorum.

"The decisions of the Board relative to Articles 24 and 26 shall be taken by an absolute majority of the whole number of the Board."

"*Article 20*

"The Economic and Social Council of the United Nations shall, in consultation with the Board, make the necessary arrangements for the organisation and working of the Board, with the object of assuring the full technical independence of the Board in carrying out its duties under the present Convention, while providing for the control of the staff in administrative matters by the Secretary-General.

"The Secretary-General shall appoint the secretary and staff of the Board on the nomination of the Board and subject to the approval of the Council."

2. *Supervisory Body—Article 5, paragraph 6, 1931 Convention as amended in 1946*

"The estimates will be examined by a Supervisory Body consisting of four members. The World Health Organization shall appoint two members and the Commission on Narcotic Drugs of the Economic and Social Council and the Permanent Central Board shall each appoint one member.

"The Secretariat of the Supervisory Body shall be provided by the Secretary-General of the United Nations who will ensure close collaboration with the Permanent Central Board."

3. *Expenses of the Permanent Central Board*

In accordance with a recommendation of the second Opium Conference of 1925, the expenses of the Board were carried on the budget of the League of Nations, and are now carried on that of the United Nations:

"The Conference requests the Council of the League of Nations to decide to include in the expenses of the Secretariat the expenses of the Central Board and its administrative services.

"It is understood that those Contracting Parties which are not Members of the League will bear their share of the expenses in accordance with a scale to be drawn up by agreement with the Council."

4. *Present position and criticism*

(*a*) Article 19 has worked quite satisfactorily; article 20, on the other hand, has given rise to conflict and difficulties, particularly on one occasion when the Secretary-General of the League of Nations refused to appoint a nominee of the Board as secretary.

(*b*) Similarly, the composition and organization of the Supervisory Body has not worked badly.

(*c*) It will be observed that the arrangements for the secretarial work of the Board and Supervisory Body are different. The secretariat of the Board is responsible for its work to the Board, but in administrative matters to the Secretary-General. This arrangement has worked only fairly well. It has given rise at certain times to difficulties which might have become serious, notably once when the Secretary-General of the League of Nations wished to restrict the freedom of communication between the secretary and the members of the Board on an administrative matter.

(*d*) The secretariat of the Supervisory Body, on the other hand, is solely responsible to the Secretary-General of the United Nations for its work and forms part of the general Secretariat of the United Nations, like the secretariat of any other committee which is provided from the staff of the United Nations. This difference in secretarial arrangements has been anomalous and undesirable.

(*e*) But the real criticism of existing arrangements is that having separate organs for the work of the Board and Supervisory Body, and separate secretariats, means overlapping work and waste of money, it leads to contradictions in the technical control and, in fact, constantly creates confusion in the minds of Governments; it is unnecessary and administratively vicious. However, it is not necessary to labour this point, as everyone agrees about it. For some years now, there has been a *de facto* merging of the two bodies, and, recently, the secretariat of the Board absorbed the work of the secretariat of the Supervisory Body, the secretary of the Board being also appointed secretary of the Supervisory Body.

(*f*) The financial arrangements which were made in pursuance of the request of the 1925 Conference, have worked fairly well. The desiderata of the Board under this head have been set out in an annex to the Board's last report (document E/OB/4) as follows:

"The expenses of the Board are carried on the budget of the United Nations and should be in the form of a separate chapter including all the expenses of the Board and its staff, except those in respect of rent, heating, all services of a general character (e.g., translation, minute-writing, mimeographing, etc.) and material supplies, which are provided by the Secretary-General without being charged to the Board's budget. The budget estimates should be prepared by the Secretary of the Board in consultation with the Bureau of the Budget of the United Nations, and approved by the Board before being submitted to the Committee on Administrative and Budgetary Questions and to the Assembly. Expenditure on the budget should require the authorization of the Secretary of the Board (or his substitute) acting on behalf of the Board. The Board has always had, and should continue to have, power to transfer credits as between sub-items of its budget even if they occur in different parts of the budget.

"Under the Final Act of the 1925 Convention, non-member States parties to the Convention are to contribute to the Board's expenses. In such circumstances, it is necessary to ascertain the Board's expenditure in order that a percentage may be assigned to such States.[10]

"To sum up, the Board is not concerned with those forms of budgetary technique which may be most convenient to the United Nations so long as:

"(*a*) Its budget is a unit;

"(*b*) The estimates for this budget have been approved by the Board or on its behalf before they go to the General Assembly;

"(*c*) Expenditure on it cannot take place without sanction given by the Board or on its behalf;

"(*d*) Power is reserved to the Board to move credits between sub-items of this budget.

"The above statement has been inserted in the present note for the sake of completeness and in order that the principles it contains should be agreed by the Economic and Social Council. In fact, provisional arrangements have been made between the Board and the Secretary-General of the United Nations for putting them into effect as regards the budget for 1949, and

[10] Cf. Section VII, Final Act of Conference of 1925.

it is expected that these arrangements will work satisfactorily."

(*g*) Such difficulties as there have been have really arisen from a root anomaly in the whole status and position of the Board. The framers of the Convention of 1925 wanted to set up a body which was independent, but they did not want to go so far as to set up a completely autonomous body like the International Court of Justice or the Food and Agriculture Organization or the World Health Organization or UNESCO; or, to take institutions existing at that time, the Danube Commission or the Postal Union. They thus created a body which they tried to make technically independent, e.g., by giving the members a tenure of office of five years, arranging that they must not hold offices directly dependent on their Governments, etc., but financially and administratively dependent on other authorities. Thus, for instance, the staff is appointed by an outside authority, the finances are provided, not by Contracting Parties, but by another international institution, many of the Contracting Parties not being members of this institution; the report of the Board goes not only to the Contracting Parties to whom it is responsible, but also to another international body, the Economic and Social Council; and this latter body has received a mandate from a group of Governments, who are not the same group as the Parties to the two Conventions, to supervise the execution of these two Conventions and, therefore, presumably the work of the Board.

(*h*) The status of the Board and of the Supervisory Body reflects this extraordinarily odd situation: they have not the status of a specialized agency, nor have they the position of an ordinary United Nations committee. They are something between the two and thus fall between two stools. This matter has also been dealt with in the above-mentioned annex to the Board's last report:

"Apart from the question of diplomatic privileges, there is the question of the formal status of the Board and of its relationship to the United Nations, its organs and specialized agencies. At present, this status is undefined and this lack of definition leads to anomalies. Thus, for instance, no provision is made for the Board except in the case of the Commission on Narcotic Drugs to be automatically represented at meetings in which it is interested, although full provision is made for the attendance of members of the International Court of Justice, specialized agencies, governmental organizations, and even non-governmental organizations. Similarly, as the Board does not figure on the list either of organs of the United Nations or of specialized agencies, the publicity desirable for its work is often not available. The Board requests the Economic and Social Council to consider measures to remedy the situation.

"The President and the Members of the Board should be entitled to appropriate privileges and immunities when on official business.

"The Board appreciates the steps taken by the Economic and Social Council at its sixth session, February-March 1948, in asking Governments to give the Members of the Board 'privileges and immunities on the lines laid down in the Convention on Privileges and Immunities as approved by the General Assembly on 13 February 1946' and inviting them 'to report as soon as possible what measures they may have taken to carry out this recommendation'. It has received communication of the replies of Switzerland, India and the United States of America, and hopes that this matter may reach a satisfactory conclusion."

5. *Suggestions*

(*a*) In order to remedy the above situation, it appears to us that there are two possibilities: the first is to tinker with the existing arrangements and try to improve them. The second would be to make a radical change, such as creating a specialized agency.

(*b*) If the first solution is to be adopted, it would be desirable that there should be in future a single international controlling authority charged with executive and administrative tasks. Under the new convention this body could have, broadly speaking, the composition, and the members could have the competences, laid down in the 1925 Convention for the Board, adding however medical qualifications. It should consist of not more than eight members. Otherwise it becomes unwieldly and expensive and it is not possible to keep its working supple and informal and, when necessary, secret. Thinking back over the last fifteen years, we are impressed by the fact that the close and continuous relationship between the members of the small Opium Board, a relationship which becomes impossible in a larger body, has greatly contributed to the cheapness, swiftness and efficacy of its work. It might be appointed as to one half by the Economic and Social Council, and as to one half by the World Health Organization; and its report should go to the Contracting Parties and to these two organizations.

(c) It is desirable to insert in the new convention some provision that the members will be selected from a panel consisting of one or more candidates put forward by each of the Contracting Parties to the convention; and that Governments in putting forward candidates make themselves responsible that these candidates will be highly qualified, will be able to give adequate time and attention to the work, and will not hold any office dependent on a Government, directly or indirectly connected with the production, marketing or controlling of narcotic drugs.

(*d*) In the above section, we have purposely not gone into the questions pertaining to the functions of the Economic and Social Council, the Commission on Narcotic Drugs and the Secretary-General of the United Nations. These are not our immediate concern and have not come within our immediate observation. At the same time we should like to record our opinion that a future convention is likely to work well in so far as there is a strict division of functions and separation of powers; and that the object should be to create, on the one hand, a policy-making body with every facility for receiving information as to the execution of the convention, discussing it, criticizing, suggesting and framing plans for the future, but with no executive or administrative responsibilities; and, on the other hand, a single international controlling authority including in its functions, and those of its secretariat, all the semi-judicial, executive and administrative tasks required under the convention, including those at present carried out by the Secretary-General of the United Nations.

(*e*) We now come to the other and more radical alternative. The above proposals have been put forward as involving the minimum of change in the existing arrangements. But there is much to be said for a more radical change and for going as far as the creation of a specialized agency covering the whole of the work in the field of narcotics control by almost all the different authorities who at present have a hand in the matter, including that of the Economic and Social Council, the Commission on Narcotic Drugs, the Board, the Supervisory Body, the experts of the World Health Organization, on habit-forming drugs, and the Secretary-General of the United Nations; but not the Arbitration Tribunal under the Hague Convention of 1907 and the International Court of Justice. Such an agency would have, say, quinquennial meetings of Governments to "legislate" and vote the budgets covering the intervening years. It should have a special reserve fund of its own. A small governing body could do the executive and administrative work, and in so far as policy was not laid down by the quinquennial meetings of Governments, there could be a policy-making council, meeting more frequently. It could appoint such technical committees as were necessary. This more radical solution would, of course, at one blow, get rid of most of such administrative difficulties and anomalies as have beset this work during the past two decades. Whether or not the question of narcotics control has become sufficiently divorced from politics for such a separate organization to be created is a matter which can be ascertained only by careful soundings among Governments. It would probably present one great advantage, viz., that it would stand a better chance of riding the storm in the event of war than if it were attached to a political organization more exposed to the risk of foundering.

IX. MISCELLANEOUS

A. Protocol of 19 November 1948

As this Protocol was drawn up in order to remedy defects of the Conventions of 1925 and 1931 in the matter of placing new drugs under control, it is the only document which we have taken into consideration.

1. *Article 1—General*

Not only "any State Party" but the WHO and any Government, should have the right to send the notification mentioned in paragraph 1. If the notification came from the WHO, it would doubtless contain the decision referred to in paragraph 2, and the procedure would merely have to be completed by the action foreseen in paragraphs 3 and 4. The decision should be communicated to all Governments, and not only to the members of the United Nations and to Contracting Parties.

2. *Article 1, paragraph 1, second and third lines*

Delete the words "which is or may be used for medical and scientific purposes and". This restriction is useless, if not undesirable.

3. *Articles 1 and 2*

The mechanism created for placing new drugs under control is rather cumbersome. Under article 1, notification is sent "immediately" (i.e., contemporaneously) to WHO, the Commission on Narcotic Drugs and Contracting Parties. We do not know whether the Commission on Narcotic Drugs will take its decision by a procedure of studying and voting by correspondence, or at an extraordinary session convoked for this purpose, or at its next ordinary session. In the first case, the procedure could hardly be satisfactory; in the second, it would be expensive; and, in the third, lengthy. The procedure adopted by WHO is to submit the question to its Committee of Experts on Habit-Forming Drugs; this Committee reports to the Executive Board of the organization,[11] which communicates the decision to the Secretary-General of the United Nations. While it should be easy for the five members of the Committee of Experts on Habit-Forming Drugs to meet (no regular sessions are foreseen), or decide by correspondence,

[11] We understand that the secretariat of WHO is obtaining a legal opinion whether it is also necessary to refer the question to WHO assembly before it becomes valid.

endorsement and communication of these decisions, first by the Executive Board and possibly by the Assembly, would delay effective action. It might very well happen that this Committee of Experts and the Commission on Narcotic Drugs would be in session simultaneously or at short intervals and discuss the one and same drug. This constitutes duplication of work. We assume, of course, that the possibility of the two bodies arriving at conflicting conclusions can be safely disregarded.

We suggest, therefore, in addition to the points raised in paragraph 1 above, that WHO Committee of Experts on Habit-Forming Drugs should be empowered to take the action at present conferred on the Commission of Narcotic Drugs under article 2. This would speed up the whole procedure, since it is easier to consult five experts than fifteen government representatives. A drug would be placed permanently under control as soon as the decision of the Committee of Experts were ratified by WHO. This would make it easier also to give effect to a recommendation made years ago by Mr. Herbert L. May and reaffirmed by the Committee of Experts at its first session, in January 1949, under which a new drug suspect of being habit-forming is to be considered as "guilty" until it is proved to be "innocent".

B. Groups I and II of Article 1, paragraph 2, of the 1931 Convention

Under the existing provisions of the various instruments of international control of narcotics, there are no arrangements whereby a drug mentioned in paragraph 2 of article 1 of the 1931 Convention could be moved, if necessary, from group II to group I, or *vice versa*. No such necessity has arisen so far, but it might be wise to make provision in the new convention to meet it.

C. Narcotic Substances which are neither "Raw Materials" nor Drugs

The technical chapters of the present study refer almost entirely to "raw materials" and drugs, and contain no suggestions regarding narcotic substances which are neither the one nor the other, such as medicinal opium and opium in the form of medicinal preparations. We do not know whether it is intended to place them under the full control applied to "drugs" or to leave them under a less rigorous system. We feel, however, that the fewer different kinds of controls there are, the better. It will have been observed that our suggestions regarding control of trade, for example, mean the suppression of need for import and export statistics. We presume that this system would also be applied to "raw materials," and suggest that it should be applied *mutatis mutandis* to all the narcotic substances falling under international control. In other words, the trade in all these substances should be controlled either through import and export authorizations or through *ex post facto* statistics—but not through both. For any hybrid system would inevitably lead to confusion and discrepancies, let alone duplication of work.

D. Publication of Statistics

The new convention should provide that the International Control Board should publish the statistics which it considers necessary in order to give a picture of the important and significant trends in the movement of narcotics, and to show how Governments fulfill their obligations. The 1925 and 1931 Conventions contain a detailed schedule of information which the Board is under an obligation to publish. The result is that the Board's reports have been swollen, and you cannot see the wood for the trees.

X. — CONCLUSION

There are certain general considerations which the experience of the secretariat and the study it has now undertaken have suggested which do not find a place under any of these headings, and which may, therefore, conveniently be included in this concluding section. They are as follows:

1. In our experience, the overwhelming disadvantage of the existing international instruments and the system they set up has been their complexity. The texts are involved and contradictory; the administrative machinery which has been set up is too complicated and gives rise to overlapping. If Governments have failed to do all their part, this has been due not only to the fact that the Conventions were in advance of public opinion or that Governments were too poor or indifferent to set up the necessary administrative machinery, but also partly to the fact that the Conventions were too involved.

2. We have, so far as lay in our power with the limited time at our disposal, tried to outline the defects of the present system, as we see them, and make concrete suggestions. It should not be inferred from this that we are convinced that such suggestions can be immediately and satisfactorily carried out. On the contrary, as our work has progressed, we have been increasingly beset by doubts as to whether the present is a good time for embarking upon a new convention. It is obvious that the machinery needs overhauling and simplifying; but by the *de facto* fusion (except as regards one member),

of the Board and Supervisory Body, and the complete fusion of their secretariats. The most important step in this direction has already been taken. The whole prospect as regards the control of narcotic drugs, the illicit traffic and addiction has been fundamentally changed in recent years by the discovery of synthetic drugs, the preparation of which may become simple and inexpensive. At that point, they will drive from the market narcotic drugs made from opium and the coca leaf and their derivatives; and the whole problem of controlling illicit trade and manufacture will take on a different aspect and will start to resemble such problems, for instance, as the abolition of the traffic in obscene publications.

Probably, opinion is ripe for a further advance in the direction of the control of raw materials, in particular opium and coca leaves. But, by far, the largest part of the coca leaf production goes in chewing and the control of chewing is not yet; in the opium production, that part which went into opium-smoking is now on the way to abolition through national action; the remainder is mostly used for the manufacture of morphine, which is in turn mostly converted into codeine. But the commercial production of synthetic morphine convertible into synthetic codeine is round the corner,[12] and if any object that the cost is and will remain prohibitive, let him compare the costs of the production of penicillin and streptomycin now and a few years ago.

3. We have thought it right to raise this question of timeliness because, while it raises matters of high policy, it also affects the detail of the control. One example may suffice to illustrate our meaning: It was believed that the Protocol of 19 November 1948 was up to date in meeting the immediate difficulty of synthetic drugs and in bringing them under the existing system. But the range of these drugs is so wide and their dangerous potentialities so uncertain that already the technical experts of WHO have made proposals which go beyond the Protocol and involve a radical change in the existing system, i.e., that drugs in these synthetic groups shall be placed under control unless and until they are proved to be non-habit-forming.

Of course, the fact that the situation is running away with one is also a reason for taking action and, no doubt, stop-gap actions of various kinds could be devised during the next few years. What we have in mind is the possibility that it is best perhaps to go slowly with any attempt at comprehensive action in the hope that the situation as regards synthetic drugs will soon become clearer.

4. We believe that the existing international instruments do not make enough concessions to the needs for simple and clear directions of the ordinary national official who, after all, in the event, has to set and keep the machinery working. We should hope that, at the Conference which is to adopt a new convention, an effort will be made to avoid obscure and ambiguous legal phraseology and language which is otherwise too technical.

5. All our proposals have been based on two assumptions. One is that national controls will be effective and the other that they will operate in good faith. This latter point is particularly important in the case of countries which possess "raw materials". For such Governments can always avoid control, as did Japan. They merely have to send plausible false information.

[12] See report of the Committee of Experts on Habit-Forming Drugs of the World Health Organization (document WHO/HFD/9).

Helen Howell Moorhead

Mrs. Moorhead, a member of the Board of Directors of the Foreign Policy Association (USA) and Chairman of its Opium Research Committee, died on 6 March 1950. For more than twenty-five years she had co-operated most actively in all efforts to establish, maintain and strengthen the national and international control of narcotic drugs.

The sense of deep loss sustained by all those connected with the work to which she devoted her life are reflectd in the telegram of condolence sent by the Secretary-General of the United Nations to the Foreign Policy Association, the reply of its President and the notice published in the *Foreign Policy Bulletin* on 17 March 1950.

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From: United Nations, Lake Success

To: Mr. Brooks Emeny, President, FPA

As the representative of the Secretary-General of the United Nations concerned with the international control of narcotics may I convey to you on behalf of the Secretariat my condolences on the death of the Chairman of your Opium Research Committee. Mrs. Moorhead's splendid work for more than twenty-five years will continue to be an inspiration to her colleagues in this field.

L. STEINIG
Director of the Division of Narcotic Drugs,
Department of Social Affairs

10 March 1950

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* *

From Foreign Policy Association

To: Mr. L. Steinig, United Nations

March 13, 1950

Dear Mr. Steinig,

Your letter of condolence with regard to the death of Mrs. Moorhead is deeply appreciated by the Board of Directors and staff of the Foreign Policy Association. Mrs. Moorhead was a member of our Board for thirty years and her contribution to the work of the Association was monumental. The cause of the fight against narcotics as well as general education in world affairs has received a severe blow in Mrs. Moorhead's death. She was a person of remarkable capacity for imaginative work and extraordinary loyalty to the causes for which she devoted her life.

With kind regards, I remain, etc.

Brooks EMENY
President

The death on March 6 of Mrs. Helen Howell Moorhead is a sad loss to the Board of Directors of the Foreign Policy Association, of which she had been a member since 1928, and to her many FPA friends. The Research Department, in whose work she always took a deep interest, will particularly miss her as a colleague and as a friend.

Mrs. Moorhead, a graduate of Bryn Mawr, began her studies of the international narcotics problem in the Foreign Policy Association in 1923. Out of these studies developed the research work of the Association, directed first by Edward Mead Earle, now a member of the Princeton University faculty; then, from 1927 to 1938, by Raymond Leslie Buell, whom Mrs. Moorhead introduced to the FPA; and since 1938 by Vera Micheles Dean. After serving as assistant to the Research Director in 1927 and 1928, Mrs. Moorhead became chairman of the FPA Opium Research Committee. Beginning in 1923 she represented the Association at sessions of the Opium Advisory Committee of the League of Nations in Geneva. Following World War II she attended the sessions of the Commission on Narcotic Drugs of the United Nations. She was the author of a *Foreign Policy Report,* "International Narcotics Control: 1936-1946", published in 1946, and contributed articles on this problem to the *Foreign Policy Bulletin.*

Mrs. Moorhead was one of the few persons in the world with a thorough knowledge of the international control of narcotic drugs. Her penetrating studies in this field commanded the respect of technical experts, and she never flagged in her endeavours to bring about understanding between nations with respect to drug control. To members of the Research Department she was a warm-hearted friend, quick to sense the problems of research, ever ready to see all sides of controversial issues and eager to offer constructive suggestions. Successful in her own field, she was generous in her appreciation of other women's accomplishments in international affairs. Liberalism based not on sentiment, but on factual knowledge, was, for her, a way of life as well as a profession of faith. Throughout her long and helpful connexion with the Board and staff of the Foreign Policy Association she contributed richly to the Association's achievements.

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SYNTHETIC SUBSTITUTES FOR MORPHINE

INTRODUCTORY NOTE

The following bibliography embodies that portion of the periodical and other literature on the subject of synthetic substitutes for morphine for which references were available at the seat of the United Nations. All but two of the articles were written after the discovery of dolantin by Eisleb and Schumann in 1939. During the past decade, a great number of articles appeared in technical journals throughout the world, but the difficulty of collecting the references was enhanced by the fact that the war and post-war dislocation hindered the work of the abstracting and indexing journals. Thus, the coverage of journals outside North America is, of necessity, quite incomplete. Every effort has been made, however, to offer as many articles as possible from journals in other parts of the world.

As regards subject-matter, the bibliography contains articles of chemical, pharmacological, medical and clinical interest. There are also references and many articles on the addiction liability of the new synthetic drugs.

The bibliography has been divided into four parts. Part I includes general works; part II covers the works concerned with dolantin; part III contains the works concerned with amidone; while part IV embraces the remaining group of articles which describe, for the most part, those drugs which are similar in chemical structure either to dolantin or to amidone. Within each part, the authors are listed in alphabetical order; in instances where an author has written several articles, the latter are listed according to the alphabetical order of the journal in which they appear.

In a few cases, the original title of an article could not be obtained, and an English translation in parentheses is offered in its place. In such instances, the language of the original article is also mentioned.

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Part III

6-DIMETHYLAMINO-4, 4-DIPHENYL-3-HEPTANONE

(Amidon(e), methadon(e), dolophine, "10,820", miadone, "AN-148", butalgin)

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ERRATA TO VOLUME II, NO. 1

In the article on "The Evolution of the International Control of Narcotic Drugs" on page 11, the last paragraph but one should read: "The suppression of opium-smoking is now accepted . . ." and in the article "Unification of Conventions on Narcotic Drugs" (Official Section), the introductory sentence, page 26, should read: "Since the first international instrument . . .".